2016-2017 catalog

- LIFE SCIENCES
- MONOMERS & POLYMERS
- MICROSPHERES & PARTICLES
- HIGH PERFORMANCE ADHESIVES, COATINGS & ENCAPSULANTS

Polysciences, Inc.
Chemistry beyond the ordinary

North America | Europe | Asia

Polysciences, Inc.
Chemistry beyond the ordinary

Ordering Information

U.S. & Canada

Corporate Headquarters
Polysciences, Inc.
400 Valley Rd. Warrington, PA 18976

(800) 523-2575
Monday - Friday 8am-6pm ET
(outside U.S. /Canada (215) 343-6484)
(800) 343-3291 fax
24 hours a day, 7 days/week
(outside U.S. / Canada (215) 343-0214)
info@polysciences.com

Online:
polysciences.com
24 hours a day, 7 days / week
(Safe, Easy and Secure ordering)

Europe

Polysciences Europe GmbH
Handelsstr. 3 D-69214 Eppelheim
Germany

(49) 6221-765767
(49) 6221-764620 fax
info@polysciences.de

Asia Pacific

Polysciences Asia Pacific, Inc.
2F-1, 207 DunHua N. Rd.
Taipei, Taiwan 10595

(886) 2 8712 0600
(886) 2 8712 2677 fax
info@polysciences.tw

Please also visit our wholly owned subsidiaries:

Bangs Laboratories, Inc.
BEADS ABOVE THE REST

Bangs Laboratories, Inc.
9025 Technology Drive
Fishers, IN 46038

(800) 387-0672 / (317) 570-7020
(317) 570-7034 fax
bangslabs.com

astraldiagnostics incorporated

Astral Diagnostics Inc.
1224 Forest Parkway
West Deptford, NJ 08066

(800) 441-0366 / (856) 224-0900
(856) 224-9466 fax
info@astraldiagnostics.com
astraldiagnostics.com

Customer Account #:

To Our Customers,

We constantly strive to improve the relevance and breadth of our product line that we offer to the worldwide research community. Our newest materials include "GMP" versions to fill a perceived gap for that need. Our ISO 13485 and FDA GMP facilities have always been available to our custom project customers, so we now seek to expand that classification. We have developed our own cover slipping tape and art restoration kits and have added a new Company to our family with the addition of Astral Diagnostics, a supplier to the physicians and veterinarians office market. Our newest magnetic particles are ideal for the latest diagnostic platform technology applications. Our excitement to supply custom-made materials to the medical device marketplace is palpable as we add manufacturing laboratories and clean suites as fast as we can. Thank you for your continued interest in what is a truly Poly ("many") sciences Enterprise.

Sincerely,

Mike, Ryan, Andrew

Michael Ott
Owner and President

Ryan Ott
Executive Vice President

Andrew Ott
Vice President Shared Resources

Easy Ordering
Call Polysciences and your call is answered by our friendly customer service staff.

Free Technical Support
We have knowledgeable, professional technical support specialists on staff ready to assist you with any questions you have about our products.

Bulk Quantity Quotes
Looking for larger quantities than we list in this catalog? We can provide you with no-obligation quotes for any of our products purchased in bulk.

Custom Synthesis
Our experienced staff of Ph.D. production and synthesis chemists can assist you in developing materials to meet your particular needs and specifications.

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About Us

Polysciences Inc. is a manufacturing company. Our chemical products are used in many scientific applications where the volume is small, but the value added is large.

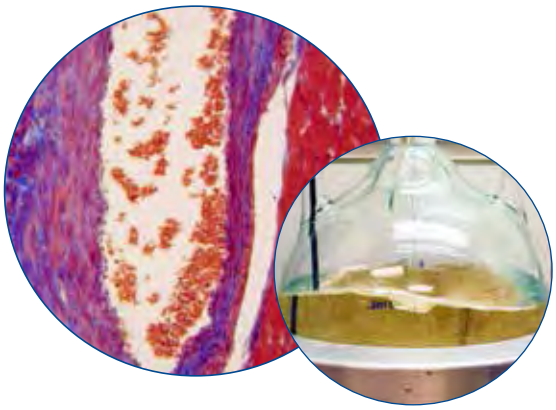
The company was founded in 1961 to provide sample preparation products for electron microscopy as nano-scale samples were starting to reveal new knowledge. Embedding products were added for histology (the study of tissue) applications soon after, enabling tissue embedment in plastic blocks, in addition to paraffin. Dyes and stains were developed to implement better visualization of the samples. In cooperation with federal agencies, monodisperse polymeric microspheres were developed for diagnostic kit applications.

Capabilities for natural product isolation and purification led to the preparation of purified material from crude biomass for the initial clinical trial of Taxol for the National Cancer Institute. Isolation and purification interests have led to superparamagnetic microspheres used for DNA, protein, and peptide discovery tools.

Our high-purity monomer and polymer products find many applications in medical devices and are used in a great variety of ways to enhance critical characteristics. Our expansion into the Electronics Polymer and Chemicals market extended our position as a manufacturer and supplier of high-purity monomers and polymers. Our particle manufacturing technology has led us to complete our line of precision microparticles useful for measurement in nanotechnology applications.

All of this experience has led us to have greater than 3,000 products, and a company culture that thrives on making new chemical materials for emerging applications. Product quality at Polysciences, Inc. is complemented by strong technical and customer support to answer questions quickly and accurately. We strive to provide the advanced technology, manufacturing competence and technical support to help our customers meet their goals.

Catalog Products



We strive to provide advanced technology, manufacturing competence and technical support to help our customers meet their goals.

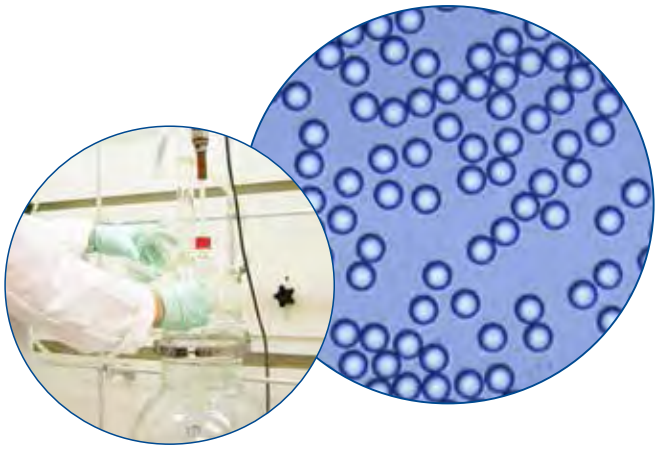
Polysciences, Inc. manufactures specialty chemicals and reagents for laboratory research, histology, light microscopy and anatomic pathology as well as other clinical and life sciences applications.

We are pleased to offer hundreds of products useful for Histology, Microscopy and Life Sciences *(page 1)* applications. Polysciences' long history of producing high quality chemicals has allowed us to hear and answer the needs of our customers as we continue to add relevant products to our portfolio.

Polysciences stocks a wide portfolio of Monomers *(page 193)***.** Such variety offers the synthetic chemist tools to make a rich array of polymer compositions. Our Monomers Selection Guide organizes this set of reactive monomers into various groupings. These organized sets of data enable customers to quickly determine which monomers may be used to synthesize custom polymers to meet the user's needs. More detailed information and chemical structures are included in the alphabetical listing or can be acquired via website or phone from our customer service representatives.

Polysciences also stocks a wide portfolio of Polymers *(page 257).* The wide variety provides any scientist the options necessary to design compositions with markedly different performance. These polymers can also be applied as platforms on which to build more complex polymer systems.

Polysciences, Inc. is a world leader in the development of Particle-based Solutions *(page 385)***.** for diagnostics, bioprocessing and instrument standardization. Our capabilities in life sciences, coupled with our expertise in specialty chemicals and electronics, allow us to offer the most comprehensive range of particle solutions in the industry and the ability to customize solutions for our clients. We are your source for organic, inorganic, biodegradable, magnetic, fluorescent, dyed and specific antibody and general protein coated particles in diameters spanning the range of 40nm to 10mm.



SOCMA MEMBER COMPANY

ChemStewards® A PROGRAM OF SOCMA

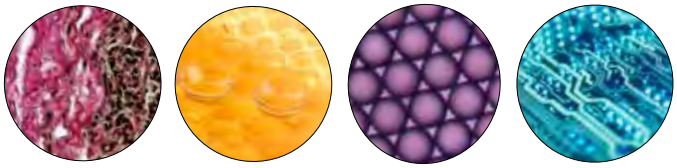
Catalog Products *continued*

Our line of BioMag® products include superparamagnetic particles and kits that offer superior performance in the isolation and purification of nucleic acids, antibodies and other proteins. Specific cell populations may be enriched or depleted using our range of BioMag® anti-CD marker particles.

We manufacture a comprehensive range of standards for analytical instruments such as flow cytometers, cell viability analyzers, particle sizers, and fluorescence microscopes. Our NIST Traceable Particle Size Standards feature low coefficients of variation, which make them suitable for use in filter challenges, instrument calibration, particulate testing, and clean room testing. Throughout our catalog you will find SureCount™ Standards, ViaCheck™ Cell Viability and Concentration Controls, and a broad range of fluorescent and antibody capture beads for flow cytometric and imaging applications.

Polysciences, Inc. offers innovative polymer products such as epoxies and silicones for use in electronic/semiconductor, adhesive, optical, dental, and marine applications *(page 465)***.** Our expanding line of products includes underfills, liquid encapsulants, die attach and optical adhesives for advanced applications. No two applications are the same so we provide custom formulation, services to meet our client's needs. Our High Performance Adhesives, Coatings, and Encapsulants division is ISO 9001 certified so you can be confident in your product's quality and reproducibility.

If a product that you require is not in our catalog, please check our website or call customer service at **1-800-523-2575** as our product line is continually expanding. Additionally, we would be pleased to discuss any custom development and manufacturing opportunities that could help meet your needs.



Our Capabilities

All manufacturing completed under ISO 13485 guidelines to ensure quality and reproducibility.

Custom Synthesis & cGMP Manufacturing

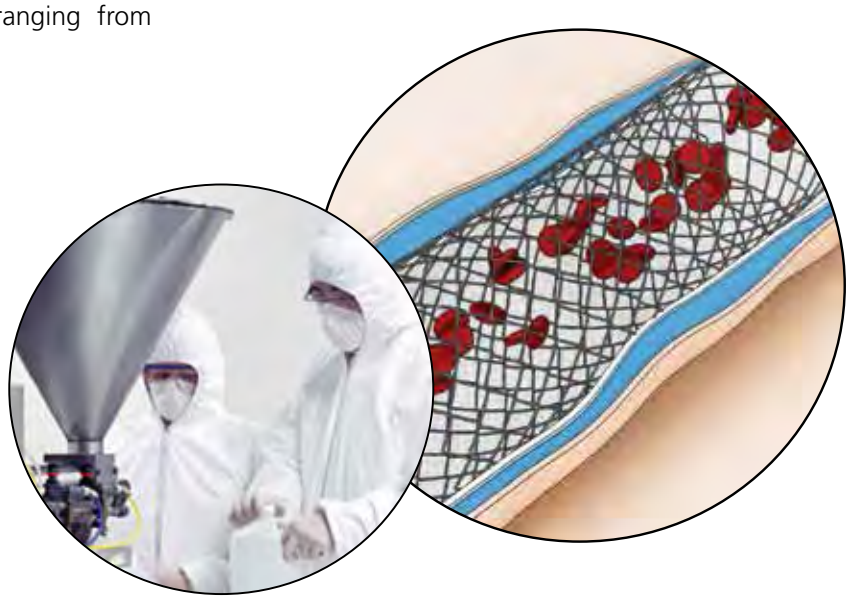
Companies and researchers often require novel and unique materials to drive innovation. Polysciences routinely partners with medical device, pharmaceutical, healthcare, governmental, chemical, and many other industries to help drive projects from development through commercial manufacture. We provide the skill, experience and chemistry support services for the synthesis of targeted compounds, starting materials, specialized reagents and other materials from milligram to thousand-kilogram scale. We provide a complete range of custom synthesis and cGMP contract manufacturing services, including: monomer synthesis, polymer synthesis, ultra-pure specialty chemicals, unique end group chemistries, and diverse molecular weights ranging from a few thousand to several million.

Contract Manufacturing

Polysciences also serves the industrial and personal care industries through contract manufacturing and packaging services. In our isolated manufacturing suites, we formulate and compound products ranging from industrial disinfectants and cleaners to histology dyes & stains to personal care intermediates and finished products. We can formulate and package gels, powders, pastes, and high or low viscosity liquids in volumes ranging from 1 gram to thousands of liters. Our equipment allows us to handle a broad range of packaging types including standard glass or plastic bottles, custom containers, tubes, packettes/towelettes, hot pours, shrink wrapping or flame sealed ampoules. We assure you full confidentiality regarding your products and processes.

Our unique approach to contract manufacturing allows us to take on challenges our competitors cannot or would not handle. ***Do you have a formula no one else can match? Unusual filling requirements? Short runs?*** **We welcome your product and the challenge!**

Your Partner for Collaborative Innovation



Our Locations

North America

Corporate Headquarters & Warrington Campus

Our Corporate Headquarters and primary manufacturing facilities are located in Warrington Pennsylvania, approximately 20 miles north of Philadelphia. Situated on more than 14 acres, our 135,000 square feet of space are allocated to manufacturing and warehousing as well as finance, human resources, purchasing, marketing, and customer service. Less than a mile from headquarters, we have an additional 70,000 square feet of manufacturing, laboratory, and office space on more than four acres particularly serving our electronics chemicals business segment including explosion proof manufacturing suites.

Europe

Polysciences GmbH

Located outside Heidelberg, our 5,000 square foot space is a sales and distribution location providing warehousing and technical support to our European customers.

Asia

Polysciences Asia Pacific, Inc.

Located in Taipei's prime financial and business district, Polysciences Asia Pacific is our most eastern sales and distributor branch, with easy access to both domestic and international airports. We provide comprehensive and timely technical support to our customers throughout the Asia-Pacific Region from within the same time zone.

Wholly Owned Subsidiaries

Bangs Laboratories, Inc.

Located just northeast of Indianapolis, this 18,000 square foot manufacturing facility is a world leader in microspheres manufacturing and particle size standards.

Astral Diagnostics Inc.

Located in West Deptford, New Jersey Astral Diagnostics contains over 17,000 square feet for manufacturing diagnostic stains and laboratory reagents.

Using This Catalog

For most of the chemicals listed in this catalog we provide hazard, handling, and storage codes as well as technical data. The information provided is believed to be current at time of printing, but is provided without warranty of any kind. We do not warrant that chemicals listed without codes are necessarily hazard free or that all codes are listed for each chemical. A typical catalog entry can be read as follows:

1 2 3 4 10 11 12

Acrylic acid min. 99.5% [79-10-7] *BEH7g* . . . . . 00020-250 250 g 49.00

MW 72.1 mp 13° bp 139° Tg 106° n_D^{20} 1.420 200 ppm MEHQ TSCA $H_2C{=}CHCO_2H$

5 7 8 9 13 14 15

Copolymerizes with many other monomers to introduce acid groups which are important in crosslinking, adhesion promotion, and stabilization of emulsion polymers. Homopolymers are water soluble.

Poly(methyl methacrylate) [9011-14-7] *A2g*

n_D^{20} 1.49 d 1.2 Tg 105° TSCA $[\text{-}CH_2C(CH_3)(CO_2CH_3)\text{-}]_n$

6

Hard, stable, non-yellowing polymer used in coatings and in molded clear plastic objects. Soluble in acetone, toluene, chloroform, MEK, THF.

18

i.v. 0.18	MW 25,000	atactic beads, 200µm	Polydispersity ~3.0	04554-500	500 g	124.00
i.v. 0.40	MW 75,000	atactic beads, 200µm	Polydispersity ~2.8	04553-500	500 g	124.00
16	MW 100,000	atactic pellets	17	17913-500	500 g	135.00
i.v. 1.25	MW 500,000	atactic beads, 200µm	Polydispersity 2.7	04552-500	500 g	135.00

1. Product Name
2. Purity: min; minimum, > greater than; ~ around
3. Chemical Abstracts Service (CAS) Registry Number
4. Hazard, Storage and Handling Codes
5. MW - Molecular weight or average molecular weight in the case of polymers.
   Mw - Weight Average Molecular Weight
   Mn - Number Average Molecular Weight
6. Density in gram/cc at 20° C
7. mp: melting point in ° centigrade.
   dec: with decomposition
8. bp: boiling point in ° centigrade at atmospheric pressure unless pressure is specified in millimeter (mm) of mercury
9. Glass transition of polymer in ° centigrade
10. Polysciences, Inc. catalog number
11. Quantity of pack
12. Price (in U.S. dollars)
13. Refractive index at 20° C on D-line. Abbreviated also as R.I.
14. Inhibitor level in parts per million unless specified otherwise.
    HQ - Hydroquinone
    MEHQ - methyl ether of hydroquinone
    BHT - butylated hydroxy toluene
    PTZ - Phenothiazine
15. Listed in TSCA inventory
16. i.v. - inherent viscosity as dl/g at 20° C
    Rel. vis. - dimensionless ratio at 20° C
17. Ratio of Mw/Mn where available
18. Soluble in: MEK - methyl ethyl ketone
    MDC - dichloromethane
    DMF - dimethyl formamide
    THF - tetrahydrofuran
    DMSO - dimethyl sulfoxide
    NMP - N-methylpyrrolidinone
19. Emiss max: Emission maximum in nm
    Exc max: Excitation maximum in nm
    λ max: Absorption maximum in nm
20. WPE: weight per epoxide
21. FP: flash point in ° C
22. pH: negative logarithm of hydrogen ion concentration
    pK: negative logarithm of dissociation constant
23. Viscosity Units:
    CPS - centipoise at 25° C unless specified otherwise
    AQ - aqueous
    CST - centistokes
24. Conductivity Units: Siemens/centimeter
25. TLC: thin layer chromatography
26. HLB: Hydrophilic lipophilic balance
27. C.I.: Color index number

International Icon / Equivalent Polysciences Code

CDEL

MPRS VWX

FG

INDH

B

Handling Codes

2 Exercise normal care in handling
3 Gloves
4 Gloves & chemical goggles
5 Gloves & fume hood
6 Gloves, chemical goggles & fume hood–no chemical mask
7 Gloves, chemical goggles & chemical mask or hood

Hazard Codes

A Harmless, use normal precautions
B Corrosive
C Flammable liquid
D Flammable solid
E Combustible
F Organic peroxide
G Oxidizer
H Irritant
I Lachrymator
J Monomer
K Hygroscopic
L Pyrophoric
M Suspected carcinogen
N Vesicant
O Skin sensitizer
P Poison (Ingestion)
R Poison (Absorption)
S Poison (Inhalation)
T Gas, inert
U Unknown
V Toxic (Ingestion)
W Toxic (Absorption)
X Toxic (Inhalation)
Y Special

Storage Codes

a Protect from light
b Protect from moisture
c Handle under dry nitrogen
d Store at 4° C
e Store below 0° C
f Store below -20° C
g Store at room temperature
h Nuisance dust
k Stench
m Do not permit to freeze
n Allow to come to room temperature before opening
p Explosive when dry
r Store at -70° C
s Long term storage at 4° C
w Refrigerate on arrival; do not freeze
x Cold pack shipment
z Dry ice shipment

Ordering Information

Through Polysciences, Inc. in the United States

Purchase orders for shipment should be directed via U.S. Mail or courier service to: Polysciences, Inc., 400 Valley Road, Warrington, PA 18976 or via email to: info@polysciences.com

Please call: **(800) 523-2575** or **(215) 343-6484** from 8:00 am to 6:00 pm EST to place phone orders. Fax orders are received automatically 24 hours a day at: (800) 343-3291 or (215) 343-0214. When ordering, please use catalog number, name of item, and quantity. Package sizes larger than listed may be available at reduced per unit prices. For large package or more than 20 units of any single item, price quotations are available by fax or phone. Confirming purchase orders are not required, but if sent must be clearly marked ***confirming***. Duplicate shipments cannot be returned for full credit.

Credit Cards

We accept: **VISA, MasterCard, American Express and Discover**
Service fee of 3% will be added to all credit card orders over $5,000.00 USD

Minimum Order Policy

Orders placed in U.S. Dollars and shipped through Polysciences, Inc.: $35.00

Special Handling Charges

For orders shipped from Polysciences, Inc. in the United States, a special handling fee of $25.00 may be added to your order for special hazardous material packaging, dry ice and/or cold pack requirements of specific products. In addition, an international order processing fee of $50.00 will be added to all orders shipped outside of the United States, to defray the added costs associated with such orders.

Return Policy

(a) Please examine your shipments upon receipt for damage or discrepancies. If a problem arises with your shipment, please contact our Customer Service Department within fifteen (15) days. We will work with you to quickly resolve any problems.

Before returning any items, all returns must be authorized by Polysciences to insure proper credit. A Return Material Authorization (RMA) must be obtained by contacting our Customer Service Department. Not all items will be authorized for return due to temperature and packing requirements. To be accepted for consideration by Polysciences, Inc. as a return for restocking, the product must be a currently listed product. Hazardous materials must be packed and labeled in accordance with the current D.O.T., A.D.R. *(GmbH)*, I.A.T.A. or I.M.D.G. regulations and practices applying to the transportation of hazardous materials. Shipping documents must also meet D.O.T., A.D.R. *(GmbH)* regulations. Non-compliant shipments will not qualify for credit. Shipping charges are the customer's/distributor's responsibility. Items returned without a RMA may not be accepted. To ensure proper credit, each Product return must include the following information: Customer Name and Address, Purchase Order Number, Polysciences Shipping Order Number, Date of Invoice, Catalog Number of Returned Item(s), Polysciences Return Authorization Number, Reason for Return.

Authorized returns should be made within 30 days of issuance of a RMA. A 25% restocking charge will be levied on materials returned because of error on the part of the buyer. The seller shall be under no obligation to replace goods that have been lost or damaged by the carrier.

(b) Products not authorized for return: Products purchased as Custom Orders, Products not purchased from Polysciences, Inc., Products with an expired shelf life, Discontinued products, Products missing labels or parts.

Method of Shipment

Unless specifically advised, we will ship by United Parcel Service, parcel post, common carrier or air freight. Rapid and reliable delivery of microspheres, particles and beads is ensured by Next Day Air for orders shipped from Polysciences, Inc., in the United States to domestic addresses. All materials requiring dry ice packaging must be shipped air express. All cold pack materials must be shipped via United Parcel Service's next day air service. For those hazardous chemicals covered by Department of Transportation and/or International Air Transport Association (IATA) regulations for flammable (red label) or hazardous items, we reserve the right to elect the most appropriate shipping method in order to comply with those regulations.

Certificates of Origin: $35.00

Polysciences, Inc. supplies Certificates of Origin documents to those customers that specifically request them. The Certificate of Origin document is not required to ship products, and is used exclusively to enable International Customers to receive a discount on import custom fees. The document is a value added service we provide to our customers.

Through Polysciences Europe GmbH in Germany

Orders shipped to European countries will be processed through Polysciences Europe GmbH and billed in Euros. Purchase orders for shipment should be directed via International mail or courier service to: Polysciences Europe GmbH, Handelsstr. 3D-69214, Eppelheim Germany or via email to: info@polysciences.de

Please call: **+49-6221-765767** from 8:00 am to 5:00 pm MET to place phone orders. Fax orders are received 24 hours a day at: +49-6221-764620

When ordering, please use catalog number, name of item, and quantity. Package sizes larger than listed may be available at reduced per unit prices. For large package or more than 20 units of any single item, price quotations are available by fax or phone.

Confirming purchase orders are not required, but if sent must be clearly marked ***confirming***. Duplicate shipments cannot be returned for full credit.

Credit Cards

Polysciences Europe GmbH only accepts **VISA**
Service fee of 3% will be added to all credit card orders over $5,000.00 USD

Minimum Order Policy

For orders placed in Euros and shipped to European countries through Polysciences Europe GmbH: On orders less than 250.00 Euro, a small order fee of 20.00 Euro will be applied to shipments outside of Germany.

Special Handling Charges

For orders shipped from Polysciences Europe GmbH in Germany, a special handling fee of 10.00 Euro may be added to your order for special hazardous material packaging or cold pack requirements of specific products. In addition, a 10.00 Euro fee will be added to all shipments requiring customs declarations. A 165.00 Euro Veterinary Customs Processing Fee will be added to certain antibodies.

Return Policy

Please examine your shipments upon receipt for damage or discrepancies. If a problem arises with your shipment, please contact our Customer Service Department within fifteen (15) days. *See full Return Policy under Polysciences, Inc. United States Ordering Information at left.*

Method of Shipment

Orders placed through the web site for shipment to European countries will be processed through Polysciences Europe GmbH. We cannot guarantee these shipments for overnight delivery. If you require expedited service, please contact Polysciences Europe GmbH directly at +49-6221-765767.

Certificates of Origin: 30.00 Euro

Polysciences Europe GmbH supplies Certificates of Origin documents to those customers that specifically request them. The Certificate of Origin document is not required to ship products, and is used exclusively to enable International Customers to receive a discount on import custom fees. The document is a value added service we provide to our customers.

Through Polysciences Asia Pacific, Inc.

Purchase orders for shipment should be placed with email, phone or courier service to: Polysciences Asia Pacific, Inc., 2F-1, 207 DunHua N. Road, Taipei, Taiwan, 10595 or via email to: info@polysciences.tw

Please call: **+886 2 8712 0600** from 9:00 am to 6:00 pm Taipei time (GMT+8) to place phone orders. Fax orders are received automatically 24 hours a day at: +886 2 8712 2677

When ordering, please use catalog number, name of item and quantity. Package sizes larger than listed may be available at reduced per unit prices. For large package or more than 20 units of any single item, price quotations are available by fax or email. Polysciences Asia Pacific, Inc. will issue an order acknowledgement.

Minimum Order Policy $50.00 USD

Handling Charges

Handling fee: $70.00 USD per shipment. For hazardous material packaged with dry ice and/or cold pack, an additional handling charge of $50.00 USD will apply.

Return Policy

Please examine your shipments upon receipt for damage or discrepancies. If a problem arises with your shipment, please contact our Customer Service Department within fifteen (15) days. *See full Return Policy under Polysciences, Inc. United States Ordering Information at left.*

Method of Shipment

Unless specifically specified, shipment will be made by FedEx, EMS, parcel post, common carrier or air freight. All materials requiring dry ice packaging must be shipped air express. For those hazardous chemicals covered by Department of Transportation and/or International Air Transport Association (IATA) regulations for flammable (red label) or hazardous items, we reserve the right to elect the most appropriate shipping method in order to comply with those regulations.

Certificates of Origin: $50.00 USD

Polysciences supplies Certificates of Origin documents under at the request of customers.

Terms and Conditions

Please refer to page 484 for a full description of our terms and conditions of sale.

Life Sciences

Specimen Collection & Grossing

Histology

Equipment & Instruments

Light & Electron Microscopy

Fluorescent Dyes & Stains

BioReagents

Cell Biology

Hematology

Microbiology

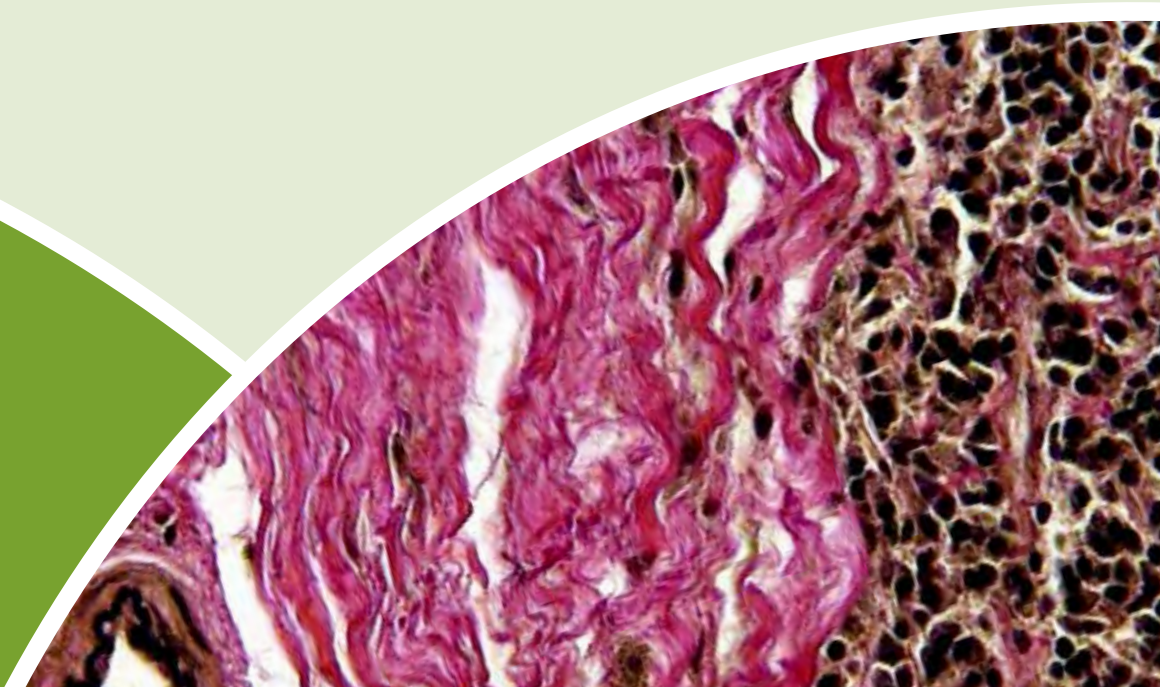
Molecular Biology

Enzymes

NeuroSciences

Diagnostic Kits for Contaminants (Abraxis)

NEW! Astral Diagnostics



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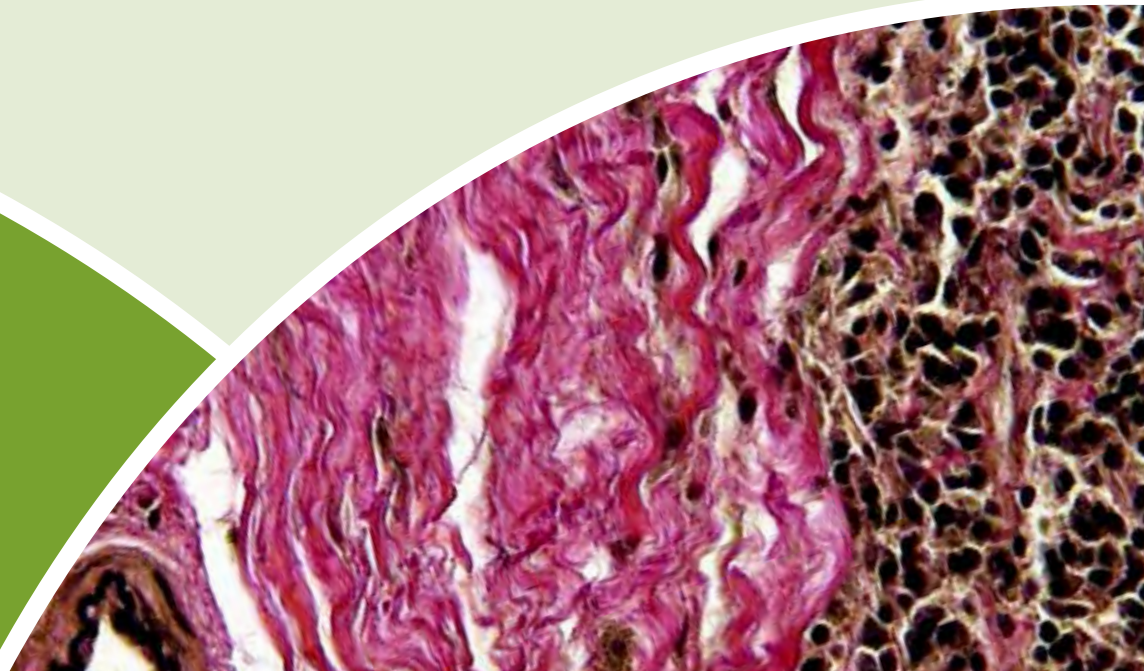

We are pleased to offer hundreds of products useful for histology, microscopy and life sciences applications. Product quality at Polysciences, Inc. is complemented by strong technical and customer support to answer questions quickly and accurately. We strive to provide the advanced technology, manufacturing competence and technical support to help our customers meet their goals. Polysciences' long history of producing high quality chemicals has allowed us to hear and answer the needs of our customers.

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Certified Dyes

Product Name	C.I. #	Cat. #	Pkg. Size(s)	Page
Acid Fuchsin	42685	24991	25 g, 100 g	54
Acridine Orange	46005	04539	5 g, 500mg	97,116,124,141
Azure A	52005	24992	25 g, 50 g	55
Biebrich Scarlet	26905	03336	100 g	55
Brilliant Cresyl Blue	51010	24993	25 g, 50 g	55
Brilliant Green	42040	24994	25 g, 50 g	55
Carmine	75470	02729	25 g	55
Chlorazole Black E	30235	02730	25 g	55
New! Cibacron Blue, F3GA	61211	25721	1 g, 5 g, 100 g	147
Congo Red	22120	02736	25 g	55
Coomassie® Blue G250	42655	03707	10 g, 50 g, 100 g	59,67
Coomassie® Blue R250	42660	00352	10 g, 50 g, 100 g	59,67
Cresyl Violet Acetate		21063	10 g	55,149
Crystal Violet	42555	00022	25 g, 100 g	55
Direct Red 81	28160	16799	25 g	59
Eosin Y	45380	02740	50 g	47,55
Fast Green	42053	02745	25 g, 100 g	56
Fluorescein isothiocyanate, isomer 1, (FITC)		00373	1 g	56
Fuchsin, basic (Pararosaniline)	42500	06342	25 g	56
Fuchsin, basic (Rosaniline)	42510	00635	25 g	56
Gallamine Blue	51045	05587	1 g	59
Gentian Violet	42555	24999	25 g	59
Giemsa Stain Powder		24998	25 g	56
Hematein (Hydroxybrasilein)	75290	01005	25 g	59
Hematoxylin	75290	02749	25 g, 100 g	47,56
Light Green SF Yellowish	42095	02753	25 g	56
Malachite Green Oxalate	42000	25002	25 g	57
Methyl Green	42590	02760	25 g	57
Methylene Blue chloride	52015	04220	50 g	57,124
Neutral Red	50040	00915	25 g	57
Nuclear Fast	60760	09773	5 g	60
Oil Red O	26125	06317	25 g, 100 g	57
Orange G	16230	00968	100 g	57
Pyronin Y	45005	18614	5 g, 25 g	57
Rhodamine 6G	45160	25004	25 g, 50 g	60
Rose Bengal	45440	25005	25 g	57
Safranin O	50240	02782	25 g	58
Sirius Red	35780	09400	10 g, 25 g	60
Sudan Black B	26150	25008	25 g	58
Tetrachrome Stain (MacNeal)	25004	02783	5 g	58,119
Thionin	52000	01220	10 g	58
Toluidine Blue O	52040	01234	25 g	58,143
Toluidine Blue O (purified)	52040	15931	10 g	58,143
Trypan Blue	23850	01294	100 g	58,119
Wright Stain		02785	25 g, 100 g	59

Embedding Media Selection Guide

Product	TDS #	Medium Type	Application		Polymerization Temp.	Time	Cat. #	Pkg. Size(s)	Page
Paraffins									
GemCut® Colored Paraffins *(Sapphire, Citrine, Emerald, Opal, Amethyst)*	691	Paraffin	Histology/IHC	Low	2 - 4° C		24363	1 case	25
Micro-Cut Paraffins	525A	Paraffin	Histology/IHC	Low	2 - 4° C		24201	4 x 2.5 kg	25
PolyFin® Paraffin *(Multiple melting points; 52 - 54°C, 56 - 58°C, 62 - 64°C)*	429	Paraffin	Histology/IHC	Med.	2 - 4° C		19562	1 case	26
Plastics									
Embed-It™ Low Viscosity Epoxy Kit	622	Epoxy	EM/Histo	Low	60° C	12-24 hrs.	24300	1 kit	30,79
Araldite® 502 Kit, Luft's Formula	128	Epoxy PO*	EM/Histo	Med.	60° C	12-24 hrs.	02600	1 kit	28,80
Araldite® 502/PolyBed® 812 Kit	128	Epoxy	EM/Histo	Med.	60° C	12-24 hrs.	02595	1 kit	28,80
Batson's #17 Anatomical Corrosion Kit	105	Methacrylate	EM/Histology	Med./ High	RT	24 hrs.	07349	1 kit	28,80
Immuno-Bed Kit	302	Glycol Methacrylate	Histology/IHC	Low	0 - 4° C	60 min.	17324	1 kit	31,75
JB-4 Plus® Embedding Kit	393	Glycol Methacrylate	Histology	Low	0 - 4° C	60 min.	18570	1 kit	32,76
JB-4® Embedding Kit	123	Glycol Methacrylate	Histology	Low	0 - 4° C	60 min.	00226	1 kit	31,76
JB-4® Mini Embedding Kit	494	Glycol Methacrylate	Histology	Low	4 - 25° C	1-2 hrs.	22507	1 kit	32,76
L.R. Gold Embedding Media	305, 641	Acrylic	EM/Histo		60° C	24 hrs.	17412	500 ml	82
L.R. White Embedding Media	305	Acrylic	EM/Histo/IHC	Very low	60° C	12-20 hrs.	17411	500 g	82
Lowicryl®HM 20 Non-polar, hydrophobic, Embedding Kit	248	Acrylic	EM/Histo	Low	-70° C	24 hrs.	15924	1 kit	32,77
Lowicryl®HM 23 Non-polar, hydrophobic, Embedding Kit	248	Acrylic	EM/Histo	Low	-80° C	12 hrs.	18162	1 kit	32,77
Lowicryl®K4M Polar Kit, hydrophilic, Embedding Kit	248	Acrylic	EM/Histo	Low	-35° C	24 hrs.	15923	1 kit	32,77
Lowicryl®K11M Polar Kit, hydrophilic, Embedding Kit	248	Acrylic	EM/Histo	Low	-60° C	12 hrs.	18163	1 kit	32,77
Methyl Methacrylate-Butyl Methacrylate Embedding Kit	408	Methacrylates	EM/Histo	Med.	40° C 60° C	12-24 hrs.	03573	1 kit	33,77
MonoStep™ Lowricryl® K4-M Polar Embedding Kit		Acrylic	EM/Histo	Low	-35° C polar 50° C non-polar	24 hrs.	23646	225 g	33,77
Osteo-Bed Bone Embedding Kit	355	Methyl Methacrylate	Histo/IHC	Med.	35° C	12-48 hrs.	17734	1 Kit	33
Osteo-Bed Plus Embedding Kit	785	Methyl Methacrylate	Histo/IHC	Med.	35° C	12-48 hrs.	24889	1 kit	33
Poly/Bed® 812 (Luft formulations) Embedding Kit / DMP-30	233	Epoxy	EM/Histo	Med.	60° C	24 hrs.	08792	1 kit	34,78
Poly/Bed® 812 (Luft formulations) Mini Kit	233	Epoxy	EM/Histo	Med.	60° C	24 hrs.	21958	1 kit	34,78
Poly/Bed® 812 Embedding Kit / BDMA (Glauert Version)	471	Epoxy	EM/Histo	Low/ Med.	60° C	24 hrs.	21844	1 kit	33,78
SPURR Low Viscosity Kit	127	Epoxy	EM/Histo	Low	70° C	8 hrs.	01916	1 kit	33
SPURR Low Viscosity Mini Kit	472D	Epoxy	EM/Histo	Low	70° C	8 hrs.	21961	1 kit	33
Unicryl		Acrylic	EM/Histo/IHC	Low	4° C	48 hrs.	22770	250 mg	33
Frozen									
PolyFreeze	678	Polyol	Histo/ IHC	Low			19636	4oz	27

Fluorophores

Product	Excitation Max	Emission Max	Cat. #	Pkg. Size(s)	Page
Acridine Orange	502nm	525nm	04539	5 g, 500mg	97,116,124,141
Calcein, 2,4-Bis(N,N'-di[carboxymethyl]aminomethyl) fluorescein	470nm	509nm	03321	1 g	98,116
CellVue® Dyes for Membrane Labeling					
Burgundy – Mini Kit	683nm	707nm	24843	1 kit	121
Burgundy – MIDI Kit	683nm	707nm	24850	1 kit	120-121
Claret – Mini Kit	655nm	675nm	24844	1 kit	121
Claret – MIDI Kit	655nm	675nm	24849	1 kit	121
Jade – Mini Kit	478nm	508nm	24904	1 kit	121
Jade – MIDI Kit	478nm	508nm	24905	1 kit	121
Lavender – Mini Kit	425nm	671nm	24841	1 kit	121
Lavender – MIDI Kit	425nm	461nm	24851	1 kit	121
Lilac – Mini Kit	423nm	471nm	25568	1 kit	121
Maroon – Mini Kit	647nm	667nm	24840	1 kit	121
Maroon – MIDI Kit	647nm	667nm	24847	1 kit	121
NIR780 – Mini Kit	743nm	776nm	24845	1 kit	121
NIR780 – MIDI Kit	743nm	776nm	24852	1 kit	121
NIR815 – Mini Kit	786nm	814nm	24846	1 kit	121
NIR815 – MIDI Kit	786nm	814nm	24853	1 kit	121
Plum – Mini Kit	652nm	671nm	24842	1 kit	121
Plum – MIDI Kit	652nm	671nm	24848	1 kit	121
Red – Mini Kit	567nm	588nm	25567	1 kit	121
New! Red – MIDI Kit	567nm	588nm	25682	1 kit	121
Coumarin 1	373nm	460nm	24185	250 g	98,116
Coumarin 6, laser grade	350nm	435nm	8037L	100mg	98,116
Cyanoditolyl Tetrazolium Chloride (CTC)	450nm	630nm	19292	1 g, 100mg	98,116,131
4',6-Diamidino-2-phenylindole dihydrochloride (DAPI)	342nm	488nm	09224	10mg, 50mg	98,117,142
Ethidium bromide	300nm	595nm	04033	5 g	99,145
Fast Blue	365nm	420nm	17740	1mg, 2mg, 5mg	99,150
Fluorescein diacetate	498nm		00615	5 g	99,117
Fluorescein isothiocyanate, isomer 1, (FITC)	499nm		00373	1 g	56
Fluorescein, Sodium Salt	460nm	515nm	24997	100 g, 500 g	99,117
Heparin, fluorescent	491nm	516nm	16092	10mg, 100mg	105
Hydroethidine™ (Dihydroethidium bromide)	365nm	420nm	17084	50mg	100,118,142
NeuroVue® Filter Squares For Neuronal Tract Tracing					
Burgundy	683nm	707nm	24838	1 filter	103,150
Jade	478nm	508nm	24837	1 filter	103,150
New! Jade Solid	478nm	508nm	25687	1 filter	103,150
Maroon	647nm	667nm	24834	1 filter	103,150
Maroon Solid	647nm	667mn	25569	1 filter	103,150
Orange	550nm	570nm	24836	1 filter	103,150
Red	567nm	588nm	24835	1 filter	103,150
Red Plus	567nm	588nm	24906	1 filter	103,150
Red Solid	567nm	588nm	24907	1 filter	103,150

Fluorophores

Product	Excitation Max	Emission Max	Cat. #	Pkg. Size(s)	Page
Propidium iodide	493nm		03748	100mg	101,142
PSVue® 380	380nm	440nm	25102	1 kit	102,118
PSVue® 480	480nm	519nm	25103	1 kit	103,118
New! PSVue® 550	553nm	615nm	25684	1 kit	103,118
New! PSVue® 643	643nm	658nm	25685	1 kit	103,119
PSVue® 794	794nm	810nm	25101	1 kit	103,119
Rhodamine 6G, C.I. 45160	528nm	551nm	25004	25 g, 50 g	60
Rhodamine B isothiocyanate, mixture of isomers	540nm	573nm	00374	250mg	101,119,143
Rhodamine WT, 5% aqueous solution	554nm	579nm	19922	4 x 8oz	101
New! SRfluor® - Stable Squaraine Rotaxane Encapsulated Dyes					
680 Alkyne	649nm	673nm	25689	1mg	104
680 Azide	645nm	668nm	25688	1mg	104
680 Carboxyl	650nm	678nm	24863	1mg	104
680 Maleimide	641nm	664nm	24865	1mg	104
680 NHS Ester	650nm	678nm	24866	1mg	104
680 Phenyl	650nm	678nm	24862	1mg	104
Thiazole orange	512nm		19352	25mg	102,125
Uvitex® 2B	350nm	435 nm in PBS buffer	19517	10 g	102,135

Ready-to-use Stains

Product Name	Use(s)	Cat. #	Pkg. Size(s)	Page
2% Acridine Orange, Ready-to-Use	RNA Stain, Apoptosis	24603	10ml	97,116,124,141
AFB Kinyoun Kit (Cold Method)	Mycobacteria - Microbiology	25765	1 kit	130
AFB Kinyoun Stain Kit with Mycobacterium Control Slide	Mycobacteria - Microbiology	25458	1 kit	130
AFB Rhodamine-Auramine Kit (Fluorescent)	Mycobacteria - Microbiology	24666	1 kit	130
AFB Ziehl-Neelson Kit (Hot Method)	Mycobacteria - Microbiology	24669	1 kit	130
Alcian Blue/PAS Kit	Histology	25086	1 kit	48
Ammonium Blue	Histology, Cytology	24819	1 gal	46
Amyloid Stain Kit (Congo Red)	Amyloids	24614	1 kit	48,149
Auramine O Stain Kit	Mycobacteria - Microbiology	24665	1 kit	97,131
Biebrich Scarlet - Acid Fuchsin Solution, Ready-to-Use	Masson Trichrome stain procedure, Plastics	24602	100ml	48
New! Bielschowsky's Silver Stain	Histology - Silver Stain, NeuroScience	25994	100 ml	48,149
Crystal Violet	Gram Staining - Microbiology	24686	1 gal	131
Differential Quik Stain Kit (Modified Giemsa)	Hematology, Cytology, Histology	24606	250ml, 500ml, 1 gal	46,117,124
Eosin Y, 0.5% alcoholic solution, Acidic	Histology Counterstain, Cytology	09859	500ml, 1000ml, 3.75L	46
Eosin Y, 1% alcoholic solution, Non-Acidic	Histology Counterstain, Cytology	17269	500ml, 1000ml	46
Fast Frozen Stain Kit	Frozen sections	24604	1 kit	47
Fontana Masson Stain Kit	Histology - Silver Stain	25104	1 kit	48
Fungi-Fluor® Kit for Fungal Detection	Fungal Stain	17442	1 kit	99,132
Fungi-Fluor® Pneumocystis Kit	PCP Stain	22363	1 kit	100,132
Gill's Hematoxylin #1 for Cytology	Cytology Stain	24242	500ml, 1000ml	117
Gill's Hematoxylin #2, double strength for Histology & Cytology	IHC Stain - Cytology/ Histology	24243	500ml, 1000ml	47
Gill's Hematoxylin #3, triple strength for Histology	Histology	24244	500ml, 1000ml	47
Gill's modified OG-6 & EA	Pap Stains - Cytology	09783	3.8L, 500ml, 1000ml	118

Product Name	Use(s)	Cat. #	Pkg. Size(s)	Page
GlycoGel Stain Kit	Histology, Electrophoresis	24693	1 kit	67
Gomori's Trichrome Stain Kit	Histology, Electrophoresis	24205	1 kit	49
Gram's Decolorizer	Microbiology	24683	1 gal	133
Gram's Iodine	Gram Staining - Microbiology	24684	1 gal	133
Gram's Stain Kit with Iodine	Microbiology	24668	1 kit	133
Gram's Stain Kit with Stabilized Iodine	Microbiology	24667	1 kit	133
Grocott Methenamine Silver (GMS) Stain Kit with Pneumocystis Control Slides	Histology - Silver Stain	25462	1 kit	133
Grocott Methenamine Silver Stain (GMS) for Fungus & PCP	Histology - Silver Stain	25087	1 kit	49
Harris Hematoxylin, Acidified (mercury-free)	Histology	24245	500ml, 1000ml	47
Jones PAS-M Stain Kit	Histology - Silver Stain	25091	1 kit, 100ml, 500ml	50
Lithium Blue	Histology, Cytology	24820	1 gal	48
Luxol Fast Blue, Ready-to-Use	Histology, Myelin	24611	500ml	49,150
Mayer's Hematoxylin	Histology - Plastic Embedding	24821	500ml, 1L	48
Multiple Stain Solution (Paragon)	Tzanck / EM / Frozen sections	08824	100ml	50
Neat Stain Hematology Stain Kit with Blood Parasite Control Slides	Hematology, Cytology, Microbiology	25460	1 kit	134
Neat Gram Stain Kit with Gram +/- Control Slides	Histology, Microbiology	25459	1 kit	134
Neat Stain Gram Stain Kit	Histology, Microbiology	25036	1 kit	134
Neat Stain Hematology Stain Kit	Histology, Microbiology	25034	1 kit	124
Neat Stain Trichrome Stain Kit	Histology, Microbiology	25035	1 kit	51
Periodic Acid Schiff's (PAS) Stain	Histology - Glycogen	24200	1 kit	51
Picrosirius Red Stain Kit	Histology - Collagen I, Collagen III	24901	250ml, 500ml	51
Poly G Blue, Ready-to-Use Stain	Histology, Electrophoresis	24609	500ml	51
Poly R Blue, Ready-to-Use Stain	Histology, Electrophoresis	24608	500ml	52
Prussian Blue Iron Stain Kit (Reaction for Demonstration of Iron)	Histology, Electrophoresis	24199	1 kit	52
Rapid Mucin Stain Kit	Mucin - Histology	24208	1 kit	52
Reticulin Stain Kit	Histology - Silver Stain	25094	250ml	52
0.4% Safranin, Ready-to-Use	Gram Staining - Microbiology	24672	1 gal	135
Scott's Bluing Reagent	Histology, Cytology	24605	32oz, 1 gal	119
Gram's Iodine - Stabilized	Gram Staining - Microbiology	24685	1 gal	133
StainRITE® Giemsa Stain (for May-Grünwald)	Hematology, Cytology	25038	100ml, 400ml	125
StainRITE® May-Grünwald Stain Solution	Histology - Hematology	24981	1L, 4L	125
StainRITE® Wright Stain Solution	Histology, Hematology, Microbiology	24986	1L, 4L, 20L	125
StainRITE® Wright-Giemsa Stain Solution	Histology, Hematology, Microbiology	24985	1L, 10L	125
Tartrazine, 0.2% Aqueous Solution	Muci & *H.Pylori* counterstain	25100	500ml	53
TB Fluorostain Kit	Mycobacteria - Histology / Microbiology	22422	1 kit	102,135
Terry's Polychrome Methylene Blue 2% Aqueous	STAT One Step - Frozen or Fixed tissue	09978	500ml	53
Villanueva Osteochrome Bone Stain	Histology - Plastic Embedding	16280	450ml	53
Von Kossa Method for Calcium Kit	Histology - Calcium	24633	1 kit	54
Weigert's Hematoxylin Kit (Solution A & B)	Histology - Nuclear Staining	25373	250ml	54
Wheatley's Trichrome Blue	Microbiology	24691	16oz	136
Warthin-Starry Stain Kit		25093	250ml	54

Specimen Collection & Grossing

Fixative & Transport Buffers

Fixatives

	Catalog #	Size
Acetic Acid Formalin for Bone Marrow and Lymph Node Fixative, Gold Standard Series Designed to fix lymphoreticular myeloid, lymph nodes and bone marrow tissues. B-5 Substitute, Mercuric. Mercury free. Technical Data Sheet #896 *Adapted from Becky Scholes, HTL, MT(ASCP) H.I.S.T.O., The Official Newsletter of the Iowa Society for Histotechnology, Tech Tip*	24910-500 24910-1	500 ml 1 liter
Acetone [67-64-1] *CH6g* CH_3COCH_3 For hardening and dehydrating tissues. It can also be used for the extraction of various principles from animal and plant substances. *Merck Index 11, 58*		
EM and Histology grade, 99.5% minimum	01921-1	1 liter
	01921-6	6 pints
	01921-4	4 liters
Glass Distilled, >99.5% minimum	08523-1	1 liter
	08523-4	4 liters
Acrolein, distilled, 99% EM grade [107-02-8] *BCOPR6acg* MW 56.1 bp 52 – 53° 1000 ppm HQ n_D^{20} 1.4025 TSCA $H_2C{=}CHCHO$ Used in combination with other aldehydes such as formaldehyde or glutaraldehyde to fix very dense specimens since acrolein penetrates and reacts faster than other fixatives. Distilled and packaged in serum vials for easy handling. Requires Poison Pack *J. Histochem. Cytochem., 30, 1307 (1982)*	00016-5	5 x 10 ml
Bouin's Fixative (Bouin's Fluid) *BHM6g* d 1.09 n_D^{20} 1.376 Picric acid, formalin and acetic acid fixative. Bouin's fixative is excellent for use in preserving soft and delicate tissue structures. The shrinking induced by the picric acid is offset by the swelling of the glacial acetic acid. Technical Data Sheet #866	16045-1 16045-G	1 liter 1 gal
Eco-Fix Derm Fixative *X7g* The fixation characteristics of Eco-Fix Derm Fixative are much better than those of formaldehyde-based fixatives, yielding consistent results even after long-term fixation. Carbohydrates, proteins, antigenic sites and nucleic acids are all effectively preserved. Tissues fixed with Eco-Fix Derm Fixative have a similar appearance to those fixed in formalin-based fixatives and also show more sensitive staining results. Features: • Specifically formulated for skin samples • Ideal for Histochemistry, Immunohistochemistry & In Situ Hybridization • Offers all the features of Eco-Fix Tissue Fixative	25060-4	4 liters

Specimen Collection & Grossing

	Catalog #	Size
Eco-Fix MB (Molecular Biology) Tissue Fixative, 1x *H3g*	25058-4	4 liters

Specially formulated to preserve antigenic sites (for antibody probes) and nucleic acid sites (for in-situ hybridizations) in their native state making predigestion or other recovery procedures for these important sites unnecessary. Replaces common fixatives including: formaldehyde-based, alcohol-based, Zenker's, B5 & B3, Bouin's and other fixatives and provides superior results. Tissues fixed in Eco-Fix MB exhibit vibrant staining, better nuclear and cytoplasmic detail and will retain a crisp appearance even after long-term fixation. Eco-Fix MB tissue fixative also retains a much more natural look and feel than formalin fixed tissue. Softer tissues mean easier, smoother cutting and sectioning. Technical Data Sheet #887

Features:

- Non-formalin based tissue fixative designed for molecular biology applications
- Preserves antigenic sites and nucleic acid sites in their native state
- Tissue retain natural look and feel compared to formalin fixed tissues
- Safe, non-toxic fixative – contains no formaldehyde, glutaraldehyde or mercury

FastFix *CHM7g*	24607-100	100 ml
	24607-500	500 ml

One-step rapid fixative for frozen sectioned tissue. Fixes tissue to slide to allow for staining procedures. Technical Data Sheet #834

Flow Fix Fixative Kits *A2d*

A sodium azide free buffer comprised of a neutral pH-buffered saline (i.e., Dulbecco's Phosphate-Buffered Saline). Sodium Azide –Free. Do not add sodium azide to buffers if you are concerned with recovering cell function. Technical Data Sheet #810 & 863

Lanier LL, Warner NL. Paraformaldehyde Fixation of Hematopoietic Cells for Quantitative Flow Cytometry (FACS) Analysis. J Immunol Meth. 1981;47:25

1% w/v paraformaldehyde	25037-1	1 kit
2% w/v paraformaldehyde	25085-1	1 kit

Formaldehyde 37%, U.S.P [50-00-0] *BHM6g*	00625-1	1 gal

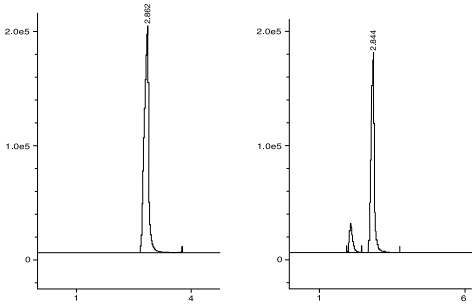
CH_2O

(Formalin 100%) Special handling charge & carrier surcharges.

Formaldehyde, methanol free, Ultra Pure [50-00-0] *BHM6g*

CH_2O

Suitable for both electron and light microscopy. Easily penetrates large blocks of tissue. When used in combination with glutaraldehyde, it fixes delicate tissues such as brain in vascular perfusion. Avoids the problem of having to depolymerize paraformaldehyde. Used in Karnovsky's fixative in conjunction with your own buffer system. Source of the formaldehyde is paraformaldehyde.



Left: Polysciences Quality Formaldehyde
Right: Formaldehyde showing methanol impurity

10%	04018-1	1 liter
	04018-4	4 x 1 liter
16%	18814-20	20 x 10 ml

Formalin, 10% neutral buffered (phosphate buffer) *BHM6g*	08379-3.75	3.75 liters
	08379-20	20 liters

(Formaldehyde 3.7%)

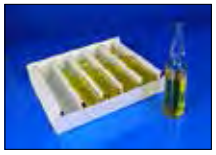
Widely used fixative for processing tissues in routine histology laboratories. Used for IHC in the clinical laboratory for paraffin embedded tissues. Volume of the fixative should be 15 – 20 times that of the tissue.

Specimen Collection & Grossing

	Catalog #	Size
Glutaraldehyde, Biological Grade [111-30-8] *HOV6g* Purified to minimize by-product formation and maximize shelf life. Suitable for most morphological studies. For more demanding purity and longer stability use EM grade glutaraldehyde. Technical Data Sheet #124		
Biological Grade, 25%	00376-500	500 ml
	00376-4	4 x 500 ml
	00376-1	1 gal
Biological Grade, 50%	00377-500	500 ml
	00377-1	1 liter
	00377-4	4 x 1 liter
Glutaraldehyde, EM Grade [111-30-8] *HOV6d* Glutaraldehyde, EM Grade, 25%, is a homobifunctional linker that is suitable for binding amine-containing ligands to amine-modified beads. We supply EM (electron microscopy) grade glutaraldehyde in ampoules to ensure the highest activity. Each ampoule is fitted with an ampoule cracker for added safety. Also available in 100 ml amber glass bottle. Technical Data Sheet #911		
EM Grade, 8%	07710-100	100 ml
	07710-5	5 x 100 ml
EM Grade, 8% (10 x 10ml)	00216A-10	10 x 10 ml
EM Grade, 8% (30 x 10ml)	00216-30	30 x 10 ml
EM Grade, 25%	01909-100	100 ml
	01909-10	10 x 10 ml
	01909-5	5 x 100 ml
EM Grade, 50%	18428-100	100 ml
	18428-10	10 x 10 ml
	18428-5	5 x 100 ml
EM Grade, 70%	01201-2	10 x 2 ml
	01201-5	5 x 10 ml
Hartmann's Fixative (modified Davidson's fixative) *BCHM7g* . . . . . . Overnight fixative for the visualization of lymph nodes in radical dissection specimens. Helpful with both breast and colon specimens by turning lymph nodes white.	24355-500	500 ml
	24355-1	1 gal
Hollandes Fixative *HM7p* . . . . . . Excellent for large and small gastric tissue, GI biopsies or any tissues that contain large amounts of inflammatory and mucinous cells. This solution is one of the best fixatives for certain kinds of protozoa. Hollandes is a preferred fixative for flagellates and ciliates which are demonstrated with silver stains. It is also an excellent fixative for routine surgical specimens.	24354-500	500 ml
	24354-1	1 gal
Karnovsky's Fixative *BHMO6d* . . . . . . Formaldehyde/Glutaraldehyde fixative commonly used in EM for structural preservation. Pre-measured in ampoules for one-step preparation. Working solution can be stored for up to 6 months at 4° C. Technical Data Sheet #974 Kit Contains: • 1 x 10ml 50% Glutaraldehyde • 2 x 10ml 16% Formaldehyde • 1 x 50ml 0.2M Phosphate Buffer	22872-5	5 kits

1. Karnovsky, M.J., A Formaldehyde-Glutaraldehyde Fixative of High Osmolarity for use Electron Microscopy. 1. Cell Biol. 27,137 A, 1965. 2. Hayat, M.A., Principles and Techniques of Electron Microscopy, Biological Applications, Third Edition, CRC Press, 1989.

Specimen Collection & Grossing

	Catalog #	Size
Methanol Fixative for Hematology . . . . . For use as a fixative prior to staining bloody specimen material or blood culture supernatant fluid. Methanol preserves the morphology of red blood cells as well as bacteria and parasites.	25092-500	500 ml
Methanol (Methyl alcohol), 99.5% – EM Grade [67-56-1] *CH6g* . . . . . Dehydrating agent of tissue as a preparation for embedment.	08032-6	6 x 1 pint
Osmium tetroxide, 2% solution *BH6g* . . . . . Post fix and stain for E.M. Microfiltered solution in pre-scored sealed ampoules with each ampoule having its own ampoule cracker. Requires Poison Pack Technical Data Sheet #119A	23310-10 23311-10	10 x 2 ml 10 x 5 ml
Osmium tetroxide, 4% solution *BH6g* . . . . . Post fix and stain for E.M. The solution is microfiltered and features exact concentration, no cross contamination, and has excellent stability when kept cold and in the dark. Supplied in pre-scored sealed ampoules with each ampoule having its own ampoule cracker. Used for post staining of DAB/peroxidase to darken and retain stain for long term storage. Requires Poison Pack Technical Data Sheet #119A *Manual of Immunoperoxidase Techniques, 2nd Ed., ASCP Press: Chicago, 1987; p58 Electron Microscopic Immunocytochemistry, Principles and Practice, Eds., Polak and Priestly, Oxford University Press, 1992; p91*	0972A-20 0972B-5 0972C-20	20 x 2 ml 5 x 10 ml 20 x 10 ml
Osmium tetroxide, crystalline, 99.95% [20816-12-0] *GPRS7g* . . . . . MW 254.2 mp 39 – 41° Post fix and stain for E.M. Supplied in pre-scored ampoules sealed in plastic bags. The ampoules are label free to avoid cleaning prior to preparation of solutions. Each ampoule is equipped with an ampoule cracker. Requires Poison Pack Technical Data Sheet #119A	0223D-10 0223A-5 0223C-10 0223B-10	10 x 1/4 g 5 x 1 g 10 x 1/2 g 10 x 1 g
Paraformaldehyde EM Grade [30525-89-4] *DH6g* . . . . . Paraformaldehyde depolymerizes in water to formaldehyde solution yielding consistent quality fixative solutions. To achieve a strong solution, raise the temperature of the water to 60° C then add sodium hydroxide solution dropwise. *Karnovsky, J. Cell Biology, 27, 137A (1965).*	00380-250 00380-1	250 g 1 kg
Poly/LEM Fixative *HM6g* . . . . . For Light and Electron Microscopy. This popular methanol-free fixative is a formaldehyde-based material formulated to eliminate the need to select a fixative for tissue based on the type of microscopy to be employed. Technical Data Sheet #303	16864-3.75 16864-4	3.75 L 4 x 3.75 L
Ruthenium tetroxide, 0.5% stabilized aqueous solution [20427-56-9] *U5d* . . . . . Useful as a staining agent for electron microscopy of polymers, as well as a fixative for biological samples. Ruthenium tetroxide penetrates tissue very slowly, reacting strongly with proteins, glycogen and monosaccharides. Ruthenium tetroxide can be used as an even more aggressive form of staining for the study of polymers by TEM than osmium tetroxide. Supplied in pre-scored ampoules each with its own ampoule cracker. Store at 4° C in refrigerator. Technical Data Sheet #320  *Hayat, M.A., Fixation for E.M., Academic Press, NY, 1981, page 194.*	18253-5 18253-10 18253-25	5 x 10 ml 10 x 10 ml 25 x 10 ml

Specimen Collection & Grossing

	Catalog #	Size
New! SAF Fixative	24677-16	16 oz

Sodium Acetate Acidic Acid Formalin
Mercury free fixative recommended for permanent staining, concentration, EIA and ELISA procedures. Albumin adhesive is included.

Features:

- Mercury free alternative
- Saves Time
- Easier and less expensive disposal

Tannic acid, EM grade [1401-55-4] *HM4abg*	04459-100	100 g

(Tannin; Gallotannin; Gallotannic acid) MW 1701.23
Useful as an EM fixative for negative staining. Also useful for enzyme immobilization and protein adsorption.
J. Microscopy, 137, 57 (1985); J. Chromatogr., 207, 13 (1981)

Zinc Formalin Fixative, pH 6.25 *HVWX6g*	21516-3.75	3.75 liters

Excellent morphological preservation of nuclear & cytoplasmic components. Can replace neutral buffered formalin for routine tissue and immunohistochemical procedures. Non-precipitating fixative which can be used with automated and manual methods. Zinc formalin is best used as a primary fixative which minimizes denaturation. Specimens initially fixed in buffered formalin may be post fixed in Zinc Formalin for a week without an effect. Technical Data Sheet #458
J. Histochem. Cytochem., 31, 1435 (1983)

Buffers

2,4,6-sym-Collidine Buffer Kit, EM Grade *HX7g*	00346-1	1 kit

(2,4,6-Trimethylpyridine Kit)

A biologically stable buffer system for osmium tetroxide and other EM fixatives. Provides better stability and buffering capacity than traditional veronal acetate buffers. One kit will make 1000 ml of buffer. Technical Data Sheet #111

Kit Contains:

- 5 x 5.34ml of Collidine
- 5 x 18ml of 1.0N HCI

Bennet, H.S. & Luft, J.H., J. Biophysics & Biochem. Cytol. 6, 113 (1959); Hendrickson, A., et al., Stain Tech., 43, 175 (1968)

Michel's Transport Medium *A2mw*	24353-500	500 ml
	24353-1	1 gal

Holding medium for tissue undergoing immunofluorescent studies. Not to be used for tissues used in Fluorescent In situ Hybridization.
Michel B. Milner Y. David K. Preservation of tissue fixed immunoglobulins in skin biopsies of patients with lupus erythematosus and bullous diseases. A preliminary report. J. Invest. Dermatol. 59: 449-452 (1972).

PolyTransport Buffer *A2g*	24311-250	250 ml
	24311-500	500 ml

Used to transport and preserve specimens from surgery to the point of grossing and fixation prior to further processing. Prevents proteins from denaturing or crosslinking and prevents bacterial growth. Also contains a cryoprotectant to prevent ice crystal formation during rapid freezing techniques and a membrane stabilizer to prevent membrane lysis. No washing of specimens necessary prior to placing in fixative or rapid freezing. Technical Data Sheet #631

Specimen Collection & Grossing

Tissue Marking Dyes

	Catalog #	Size
Tissue Marking Dye – 7 Color Kit *H6gm*	24772-1	1 kit

Makes marking margins of excised tissue specimens easier than ever before. Kit contains opaque pigments formulated for excellent adherence to tissue surfaces. Colors selected to avoid confusion with routine histological stains. The viscosity allows for an even, thin coating of pigment, penetrating the tissue surface slightly to allow it to remain visible through routine tissue processing. Technical Data Sheet #445

Kit Contains 2 oz. bottle of dye:

- Blue
- Black
- Yellow
- Red
- Green
- Orange
- Purple
- Convenient holder and application sticks

Tissue Marking Dye – 5 Color Kit *H6gm*	24108-1	1 kit

Kit Contains 2 oz. bottles of dye:

- Blue
- Black
- Yellow
- Red
- Green
- Convenient wood bottle holder and application sticks

Tissue Marking Dye Replacement Bottles – 2 oz. and 8 oz.
Technical Data Sheet #445

Black	24113-2	2 oz
	24113-8	8 oz
Blue	24111-2	2 oz
	24111-8	8 oz
Green	24110-2	2 oz
	24110-8	8 oz
Orange	24117-2	2 oz
	24117-8	8 oz
Purple	24120-2	2 oz
	24120-8	8 oz
Red	24109-2	2 oz
	24109-8	8 oz
Yellow	24112-2	2 oz
	24112-8	8 oz

Specimen Collection & Grossing

Catalog #	Size
25602-1	1 kit

New! TMD Biopsy Station Kit (Grossing) *GM6h*

Makes marking margins of excised tissue specimens and numerous small biopsies easier than ever before. The TMD Biopsy Station Kit contains opaque pigments formulated for excellent adherence to tissue surfaces. Colors selected to avoid confusion with routine histological stains. The viscosity allows for an even, thin coating of pigment, penetrating the tissue surface slightly to allow it to remain visible through routine tissue processing. All the necessary gross room consumables are at your fingertips, eliminating the need to reach in different areas of your station or get up from your station looking for sponges, mesh biopsy bags, tissue marking dye applicator, swabs, and keeps the TMD bottle caps in place. **Dimensions**: 8.7" L x 7.5" D x 3.8" H (with canister)

Features:

- Save Time! No post fixative required
- Fast drying – high quality opaque pigments
- Dyes can be used on fresh or formalin fixed specimans
- Maintains brilliant color through all phases of processing
- Convenient 2 oz. & 8 oz. replacement bottles available

Kit Contains 2 oz. bottle of each:

- Blue, Black, Yellow, Red & Green
- Convenient holder and application sticks

Decalcifying Reagents

24900-250	250 ml
24900-500	500 ml

***Deli-Cal* Block Solution** *BH4g*

Our microtome soak, *Deli-Cal* Block Solution saves time and money by allowing you to salvage problem blocks right at cutting stations. The quality and thoroughness of *Deli-Cal* Block Solution is dependent upon the original decalcification procedure and condition of the specimen.

Benefits:

- Useful for Bone Marrows, Special Stains and IHC
- Enhances ribbon cutting
- Salvages undecalcified and under processed bone marrow biopsies at the cutting station
- Fast soaking procedure
- Environmentally safe and biodegradable

24903-250	250 ml
24903-500	500 ml

***De-Calcify* Block Solution** *BH4g*

Use *De-Calcify* Block Solution as a fast microtome soak that saves you time and money by allowing you to salvage problem blocks right at your cutting station.

Benefits:

- Enhances ribbon cutting
- Useful for H&E and routine staining
- Fast soaking procedure
- Ready-to-use formulation
- Environmentally safe and biodegradable

Specimen Collection & Grossing

	Catalog #	Size
Poly-NoCal *B4g*	24164-1	1 liter
	24164-3.8	3.8 liters
Poly-NoCal & Fixative *BHM6g*	24163-1	1 liter
	24163-3.8	3.8 liters
Poly-NoCal End Point Determination Kit	24119-1	1 kit
Super Decalcifier I: Delicate *BH4g*	24888-500	500 ml
	24888-1	1 liter
	24888-6	6 x 1 liter
Super Decalcifier II: Heavy Duty *BH4g*	24887-500	500 ml
	24887-1	1 liter
	24887-6	6 x 1 liter

Poly-NoCal *B4g*

Poly-NoCal is a specially formulated solution of high purity hydrochloric acid and EDTA. Designed for rapid decalcification of fixed tissue sections, our formulation also includes buffers to help prevent cellular swelling or distortion. Technical Data Sheet #523 & 524

Poly-NoCal & Fixative *BHM6g*

Poly-NoCal & Fixative is a formic acid and formaldehyde based solution designed to fix and decalcify in one easy, convenient step. Small histological specimens, such as bone marrow, will achieve softening sufficient for sectioning in four hours. Technical Data Sheet #523 & 524

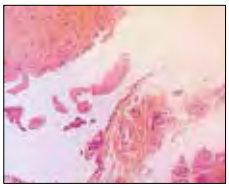
Poly-NoCal End Point Determination Kit

Control of decalcification is an important part of tissue morphology. Over-decalcification interferes with nuclear and cytoplasmic staining and also destroys cell structure. Under-decalcification causes poor dehydration and infiltration during processing and also results in sectioning problems. Poly-NoCal End Point Determination Kit includes all the necessary materials you need to determine endpoint decalcification, accurately, consistently and conveniently. While actual use conditions may vary, each kit typically performs approximately 200 tests, helps to save you time and money and increases productivity. Technical Data Sheet #523 & #524

Kit Contains:

- 500 ml 5% Ammonium hydroxide
- 250 ml 5% Ammonium oxalate
- pH papers and measuring vials (components are also sold separately).

Super Decalcifier I: Delicate *BH4g*



Human Degenerative Joint Disease, decalcified with Super Decal I Delicate Decal, stained with H & E, 10X

Recommended for use with delicate specimens and specimens (such as bone marrow biopsies (core) that are to be submitted to IHC, cytochemistry and special stain procedures. Biodegradable. Technical Data Sheet #786

Benefits:

- Save Time – Decalcify in as little as 3 hours!
- Ready-to-use decalcifier for human and animal tissues
- Recommended for IHC, special stains and routine stains
- Enhanced nuclear detail

Super Decalcifier II: Heavy Duty *BH4g*

Human Degenerative Joint Disease, decalcified with Super Decalcifier II - Heavy Duty,stained with H & E, 40X

For hard compact bone, (i.e. femur heads, above-the-knee amputation (AKA) and below-the-knee amputation (BKA). Extremely effective and versatile decalcifier that can be used in specific lab routines. As with most acids, nucleic acids in the cell can become subject to ribonuclease digestion, resulting in a loss of basophilic properties. Most decalcification occurs in approximately 4 – 6 hours or less, depending on the thickness and density of the specimens. Overnight decalcification should be avoided. Not recommended for IHC. Technical Data Sheet #786

Benefits:

- Biodegradable
- Save Time – Decalcify in as little as 3 hours!
- Ready-to-use decalcifier for human and animal tissues

Specimen Collection & Grossing

Catalog #	Size

Mohs Lab

Mohs Lab Reagent Starter Kit . . . . . 25044-1 — 1 kit

All the reagents needed to start a complete MOH's lab. From cryotomy, fixation, staining and orientation, to the complete product of a finished slide that can be viewed within minutes.

Kit Contains:

- PolyFreeze Frozen Mounting Medium (case)
- Blue Tissue Marking Dye (2oz. bottle)
- Black Tissue Marking Dye (2oz. bottle)
- Green Tissue Marking Dye (2oz. bottle)
- Fast Frozen Stain Kit
- Differential Quik Stain Kit (250ml)
- Tissue Tack™ Microscope Slides – Plus (+) Glass (72 slides)
- Delicate Melanin Bleach Kit

Accessories

New! Biopsy Bags, Small (Nylon Mesh) *A2g* . . . . . 25564-100 — 100 bags; 25564-200 — 200 bags; 25564-500 — 500 bags; 25564-1000 — 1000 bags

Reduces risk of small specimen loss. Easy peel design allows unrestricted fluid movement around tissue. Bags peel open for quick and easy specimen removal. Material will not disintegrate in processing reagents.

Dimensions: Width 1.18" (30 mm) Length 1.97" (50 mm)

New! Biopsy Bags, Medium (Nylon Mesh) *A2g* . . . . . 25565-100 — 200 bags

Reduces risk of medium specimen loss. Easy peel design allows unrestricted fluid movement around tissue. Bags peel open for quick and easy specimen removal. Material will not disintegrate in processing reagents.

Dimensions: Width 1.74" (44 mm) Length 2.92" (74 mm)

Blue Biopsy Foam Pads

Used to hold biopsies in place and prevent them from being lost during processing. Made of a specially formulated foam which is always verified for consistency throughout in order to achieve optimum solvent flow. Biopsy samples are sandwiched between two foam pads and are placed either in tissue capsules or cassettes with metal or plastic lids. Will resist temperatures from -40° C – 121° C.

30.2mm x 25.4mm x 2mm – 1000 pads	25492-1	1 pk
30.2mm x 25.4mm x 2mm – 10,000 pads	25492-10	1 case
25.4mm x 2.7mm – 1000 pads	25493-1	1 pk
25.4mm x 2.7mm – 10,000 pads	25493-10	1 case
34.55mm x 2mm – 1000 pads	25494-1	1 pk
34.55mm x 2mm – 10,0000 pads	25494-10	1 case
27.4mm x 25.4mm x 2mm – 1000 pads	25495-1	1 pk
27.4mm x 25.4mm x 2mm – 10,000 pads	25495-10	1 case
30.2mm x 25.4mm x 2mm – 1000 pads	25496-1	1 pk
30.2mm x 25.4mm x 2mm – 10,000 pads	25496-10	1 case

Specimen Collection & Grossing

	Catalog #	Size
Brush, Red Sable, Size 00000 Fine brush for manipulating samples or cleaning delicate items. Natural fiber tip tip is 1cm long and 2mm thick. Total brush length 17.5 cm.	08411-1	1 brush
Dental wax *A2g* Low melting point wax, used for sealing boats onto glass knives. Also used as a contamination free surface for mincing tissue. Dimensions: 6″ x 3″ x 1/16″ (150mm x 75mm x 1.5mm)	00403-1 00403-5	1 lb 5 lb

Histology

Accessories

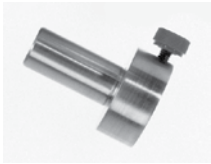
Glass Scriber, Diamond Natural Diamond at 90° angle in a metal mounting. It is fitted with a protective cover and pocket clasp. Useful for scoring glass strips prior to hand making glass knives, marking slides and property identification.	03636-1	1 unit

JB-4 Aluminum Chuck (11mm shaft, 10mm diameter) Reusable aluminum chuck supplied complete with thumbscrew. Designed for use with our Plastic Block Holders *(Cat. #15899)* and molding trays. Compatible with: Hacker, A/O Reichert rotary and Autocut, JB-4 and JB-4A, LKB Ultratomes and Shandon Hypercut.	15901-1	1 unit

JB-4® Plastic Block Holders Easy to store plastic block holders for resin. Matte surface for easy marking and a large center hole to prevent bubble formation. Block Holders fit securely onto molding cup tray cavities. Attach to Polysciences' reusable chucks designed for commonly used microtomes.	15899-50	50 holders

JBA Aluminum Chuck (11mm shaft, 11mm diameter) Reusable aluminum chuck with three point recessed block holder attachment, supplied complete with Allan screws and hex key. Designed for use with our Plastic Block Holders *(Cat. #15899)* and molding trays. Compatible with: LKB Histo Range and Reichert Super Cut, Hacker, A/O Reichert rotary and Autocut, JB-4 and JB-4A, LKB Ultratomes and Shandon Hypercut.	16828-1	1 unit

LKB Huxley Chuck Reusable chucks designed to be used with Polysciences *(Cat. #15899)* Plastic Block Holders and molding trays. Available for a range of microtomes.	16207-1	1 unit



Vibratome Fluorescent Lamp Replacement	15982B-1	1 unit

Histology

Slide Holders & Storage

	Catalog #	Size
Glass Slide Holder	25467-1	1 holder
Microscope Slide Holder Block *A2g*	24764-1	1 holder
Microscope Slide Holder, Peel-A-Way	19801A-1	1 case
Microscope Slide Mailing Tubes	23998-10	10 tubes
Microscope Slide Staining Jar	08415-3	3 jars
Microscope Slide Storage Box, Mahogany Large Box	16885-1	1 box

Glass Slide Holder

Time saving adjunct to frozen section staining, special staining, immunostaining procedures "from beginning to end."

Features:

- Each Glass Slide Holder holds five slides
- Easy to apply PAP Pen *(Cat. #24231-1)*
- Up to 50 slides (10 holders) can be processed in one staining vessel
- Batch of 100, 150 or more can be processed
- Multiple slides can be handles efficiently
- Help minimize technicians exposure Time to xylene, alcohol, and DAB, etc.

Microscope Slide Holder Block *A2g*

Durable, chemically resistant polyethylene Microscope Slide Holder Block will accommodate up to 40 separate 3" x 1" microscope slides. Angled slide holder slots permit ease of access to individual slides and rapid viewing of slide labels. The polymer composition of the block resists staining and washes clean with ethanol or isopropanol or other organic solvents.

Microscope Slide Holder, Peel-A-Way

Microscope slide holders constructed of durable plastic. These grips fit any Coplin jar or our Polyjar *(Cat. #08415)* Carton contains 6 grips.
Technical Data Sheet #433

Features:

- Chemical and solvent resistant
- Capable of withstanding temperatures up to 80° C

Microscope Slide Mailing Tubes

Polypropylene tubes to hold 1 – 4 slides. Can be used to mail slides and to store small numbers of slides. Also these mailing tubes can be used as miniature Coplin jars to dip slides in photographic emulsion for autoradiography. The advantage of using these jars with emulsion is that they require only a small amount of emulsion, they are disposable, and you don't have to worry about cross-contamination from one batch of emulsion to the next.

Microscope Slide Staining Jar

Unbreakable, translucent plastic, stain resistant and chemically inert. Larger opening than classic Coplin staining jar for more convenient slide staining.

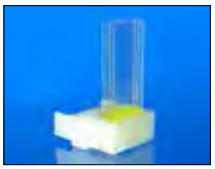
Features:

- Durable polypropylene construction
- Stores up to 10 standard slides
- Microwavable if uncapped
- Steam autoclavable at 121° C (250° F)

Microscope Slide Storage Box, Mahogany Large Box

Holds 100 slides (Negafile).

Histology

	Catalog #	Size
Microscope Slide Storage Box, Plastic large box . . . . . Holds 100 slides (slide saver).	16604-1	1 box
Microscope Slide Storage Box, Plastic small box . . . . . Holds 25 slides (slide saver).	16603-1	1 box
Microscope Slide Storage Cabinet . . . . . A stackable six-drawer cabinet accommodating up to 5000 3"x 1" glass slides. The base unit (sold separately) has rubber feet to prevent scratching the bench surface. There are removable drawers for easy handling & transport. The rail suspension design prevents drawers from being accidentally pulled out & spilling the contents. Sponge blocks are provided to support slides in partially filled drawers. The cabinets interlock when stacked. You can stack up to 10 cabinets high. Dimensions: W x D x H: 15 3/4" x 19" x 5"(40 x 48.3 x 12.7 cm)	22352-1	1 unit
Microscope Slide Storage Cabinet Base Unit . . . . . Base unit has rubber feet to prevent scratching the bench surface and supports a stackable six-drawer cabinet (sold separately) accommodating up to 5000 3"x 1" glass slides. Dimensions: W x D x H: 15 3/4" x 19" x 5"(40 x 48.3 x 12.7 cm)	22353-1	1 base
Microscope Slide Temporary Storage Tray . . . . . Capacity of 20 microscope slides, stored in a horizontal position for full visibility. The white background makes it easy to distinguish dyes & stains. Finger cut-outs simplify removal of slides.	16602-1	1 tray
Neat Stain Slide Holder . . . . . Durable slide holder. Adjusts to hold 2-5 slides for easy processing. 	25033-1	1 unit

Histology

	Catalog #	Size

StainTray™ Slide Staining System

A user friendly approach to immunohisto-chemistry staining. This tray is also suitable not only for routine staining requiring a humid chamber, but also ideal for Hematology, Cytology and Microbiology laboratories. Manipulation is made safe and easy by using only one hand.

Black base made of tough ABS plastic withstanding a wide range of chemicals (Avoid chlorinated hydrocarbons). Accepts 10 or 20 slides on four plastic rails covered with a polymer strip to perfectly hold slides even if tray is held at an angle. When humidity is needed, wells between rails will hold up to one ml of water securely without splashing. Middle wells will hold up to 2 ml each. Rails are raised not only to avoid water touching the slides but to make them more easily retrievable. Base will also hold excess stain solution dripping from the slides. Four rubber feet ensure greater base stability. Units are stackable for space saving purposes.

Two cover styles are available:

- Clear, allowing for visual examination. Made of PETG with a temperature range of -20° C – 60° C.
- Black, for fluorescent work. Made of ABS with a temperature range of -80° C – 80° C.

Dimensions with cover:

- 10 Slide – 24 x 24 x 4.5 cm H (9 3/8 x 9 3/8 x 1 3/4 in. H)
- 20 Slide – 38 x 24 x 4.5 cm H. (15 x 9 3/8 x 1 3/4 in. H)

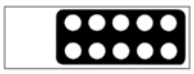
Lid (10 Slide Capacity) – Black	25500-1	1 unit
Base (10 Slide Capacity) – Black	25498-1	1 unit
Lid (10 Slide Capacity) – Clear	25499-1	1 unit
Base (10 Slide Capacity) – Clear	25497-1	1 unit
Lid (20 Slide Capacity) – Black	25504-1	1 unit
Base (20 Slide Capacity) – Black	25502-1	1 unit
Lid (20 Slide Capacity) – Clear	25503-1	1 unit
Base (20 Slide Capacity) – Clear	25501-1	1 unit

Microscope slides

Microscope Control Slides . . . . . 24012-1 — 72 slides

A new approach to control slides. This slide allows the control specimen and the Patient's specimen to be on the same slide with positive identification of both specimens. Identical Patient and Control stain procedures. The slide has a frosted end for easy marking and special coating for enhanced sample adhesion to the slide.

Microscope Slides, Immunofluorescence . . . . . 18357-1 — 100 slides



These slides have a durable teflon coating that is acetone-resistant, autoclavable and hydrophobic. Slides are 1" x 3" (25mm x 75mm), 1mm thick and are useful for all fluorescent materials. These glass slides have ten 6mm wells and are frosted on one end for easy labeling.

Histology

	Catalog #	Size
Poly-L-Lysine Coated Microscope Slides [12236-82-7]	22247-1	72 slides

Slides are coated with Poly-L-Lysine to permit electrostatic coupling of sample to slide. The relative adhesion level permits easier manipulating of samples than with silane coated slides. Use of Poly-L-Lysine Microscope Slides does not affect staining procedures. Technical Data Sheet #518

Dimensions: 25mm x 75mm x 1mm

Tissue Tack™ Microscope Slides – Plus (+) Glass	24216-1	72 slides

Treated with a specially formulated aminoalkylsilane, Tissue Tack slides provide a positively charged surface, which permits instant coupling of negatively charged tissue sections. The resultant bond stands up to the very aggressive solutions used in In-Situ Hybridization procedures. Slides are available with a white label. Technical Data Sheet #518

Fixatives

Acetic Acid Formalin for Bone Marrow and Lymph Node Fixative, Gold Standard Series	24910-500	500 ml
	24910-1	1 liter

Designed to fix lymphoreticular myeloid, lymph nodes and bone marrow tissues. B-5 Substitute, Mercuric. Mercury free. Technical Data Sheet #896

Adapted from Becky Scholes, HTL, MT(ASCP) H.I.S.T.O., The Official Newsletter of the Iowa Society for Histotechnology, Tech Tip

Eco-Fix Derm Fixative *X7g*	25060-4	4 liters

Carbohydrates, proteins, antigenic sites and nucleic acids are all effectively preserved. Tissues fixed with Eco-Fix Derm Fixative have a similar appearance to those fixed in formalin-based fixatives and also show more sensitive staining results.

Features:

- Specifically formulated for skin samples
- Ideal for Histochemistry, Immunohistochemistry & In Situ Hybridization
- Offers all the features of Eco-Fix Tissue Fixative

FastFix *CHM7g*	24607-100	100 ml
	24607-500	500 ml

One-step rapid fixative for frozen sectioned tissue. Fixes tissue to slide to allow for staining procedures. Technical Data Sheet #834

Fixative & Transport Buffers

Formaldehyde 37%, U.S.P [50-00-0] *BHM6g*	00625-1	1 gal

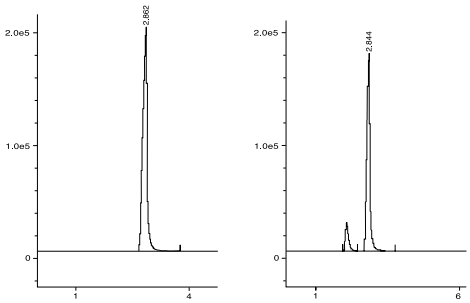
CH_2O

(Formalin 100%) Special handling charge & carrier surcharges.

Histology

	Catalog #	Size

Formaldehyde, methanol free, Ultra Pure [50-00-0] *BHM6g*
CH_2O
Suitable for both electron and light microscopy. Easily penetrates large blocks of tissue. When used in combination with glutaraldehyde, it fixes delicate tissues such as brain in vascular perfusion. Avoids the problem of having to depolymerize paraformaldehyde. Used in Karnovsky's fixative in conjunction with your own buffer system. Source of the formaldehyde is paraformaldehyde.



Left: Polysciences Quality Formaldehyde
Right: Formaldehyde showing methanol impurity

10%	04018-1	1 liter
	04018-4	4 x 1 liter
16%	18814-20	20 x 10 ml

Formalin, 10% neutral buffered (phosphate buffer) *BHM6g* . . . . . .
(Formaldehyde 3.7%)
Widely used fixative for processing tissues in routine histology laboratories. Used for IHC in the clinical laboratory for paraffin embedded tissues. Volume of the fixative should be 15 – 20 times that of the tissue.

	08379-3.75	3.75 liters
	08379-20	20 liters

Glutaraldehyde, Biological Grade [111-30-8] *HOV6g*
Purified to minimize by-product formation and maximize shelf life. Suitable for most morphological studies. For more demanding purity and longer stability use EM grade glutaraldehyde. Technical Data Sheet #124

Biological Grade, 25%	00376-500	500 ml
	00376-4	4 x 500 ml
	00376-1	1 gal
Biological Grade, 50%	00377-500	500 ml
	00377-1	1 liter
	00377-4	4 x 1 liter

Zinc Formalin Fixative, pH 6.25 *HVWX6g* . . . . . .
Excellent morphological preservation of nuclear & cytoplasmic components. Can replace neutral buffered formalin for routine tissue and immunohistochemical procedures. Non-precipitating fixative which can be used with automated and manual methods. Zinc formalin is best used as a primary fixative which minimizes denaturation. Specimens initially fixed in buffered formalin may be post fixed in Zinc Formalin for a week without an effect. Technical Data Sheet #458
J. Histochem. Cytochem., 31, 1435 (1983)

	21516-3.75	3.75 liters

Histology

Tissue Processing

Cassettes, Biopsy Bags & Sponges

Blue Biopsy Foam Pads

Used to hold biopsies in place and prevent them from being lost during processing. Made of a specially formulated foam which is always verified for consistency throughout in order to achieve optimum solvent flow. Biopsy samples are sandwiched between two foam pads and are placed either in tissue capsules or cassettes with metal or plastic lids. Will resist temperatures from -40° C – 121° C.

	Catalog #	Size
30.2mm x 25.4mm x 2mm – 1000 pads	25492-1	1 pk
30.2mm x 25.4mm x 2mm – 10,000 pads	25492-10	1 case
25.4mm x 2.7mm – 1000 pads	25493-1	1 pk
25.4mm x 2.7mm – 10,000 pads	25493-10	1 case
34.55mm x 2mm – 1000 pads	25494-1	1 pk
34.55mm x 2mm – 10,0000 pads	25494-10	1 case
27.4mm x 25.4mm x 2mm – 1000 pads	25495-1	1 pk
27.4mm x 25.4mm x 2mm – 10,000 pads	25495-10	1 case
30.2mm x 25.4mm x 2mm – 1000 pads	25496-1	1 pk
30.2mm x 25.4mm x 2mm – 10,000 pads	25496-10	1 case

Peel-A-Way® Tissue Capsules . . . . . 19802A-1 1 carton

Resistant to most chemicals and acids used in processing. Provides three compartments for average size specimens and a removable divider for larger (34mm) specimens. They are weighted to assume upright position for complete exposure during processing. Use with all epoxy, GMA, MMA and acrylic resins. Technical Data Sheet #433

Tissue Cassettes

Allows infiltration, embedding, sectioning and filling steps to be done with a single specimen container. They have a plastic lid & base which are resistant to solvents, microwaving techniques and decalcifying solution. Their universal size fits all popular base molds and they may be used with stainless steel process covers. The unique patented design permits maximum fluid exchange and drainage.

Dimensions: 32mm L x 26mm W x 5mm D

Blue	21468-250	250
Pink	21471-250	250
Yellow	21469-250	250

Histology

Dehydration & Clearing Reagents

Acetone [67-64-1] *CH6g*
CH_3COCH_3
For hardening and dehydrating tissues. It can also be used for the extraction of various principles from animal and plant substances.
Merck Index 11, 58

	Catalog #	Size
EM and Histology grade, 99.5% minimum	01921-1	1 liter
	01921-6	6 pints
	01921-4	4 liters
Glass Distilled, >99.5% minimum	08523-1	1 liter
	08523-4	4 liters

Alcohol Reagent, 100% - Histology Grade *C5g* . . . . . 09860-1 — 1 gal
Composed of 90 parts ethyl alcohol, 5 parts methyl alcohol and 5 parts isopropyl alcohol, v/v blend. Suitable for most histological procedures.

New! CiDecon® ST *E4g* . . . . . 25989-1 — 24 x 2 oz
CiDecon® ST Sterile concentrated phenolic disinfectant is individually double-bagged, gamma-irradiated and tested to ensure sterility. Diluted at a ratio of one ounce per gallon (1:128), CiDecon® ST provides broadspectrum efficiancy against a wide variety of organisms, including TB, in the cleanroom environment. 20 oz. SingleServ™ is premeasured to make 2 gallons of working solution at the correct dilution. Conforms to OSHA's Bloodborne Pathogens Standard. Each case is shipped with a Lot Specific Document detailing parameters of QC, irradation and sterility. EPA registered.

New! CiDehol® ST Sterile 70% IPA from Decon Laboratories *C4g* . . . . . 25649-12 — 16 x 12 oz bottles
Sterile, ready-to-use 70% isopropyl alcohol (IPA) solution designed especially for cleanroom use. Made with Water-For-Injection (WFI), filtered to 0.2 µm, individually double-bagged and gamma-irradiated to ensure sterility. Made according to USP specifications and packaged in a Class 100 cleanroom. Each lot undergoes a bacterial endotoxin test to ensure that the product meets or exceeds "Water-for-Injection" quality in endotoxin limits and each lot also undergoes a USP 14-day sterility test. Each case is shipped with lot specific documentation which details QC, irradiation, sterility and bacterial endotoxin limits.

25649-16	12 x 16 oz bottles
25649-8	8 x 32 oz bottles
25649-1	4 x 1 gal
25649-32	12 x 32 oz bottles

Clear-Advantage Xylene Substitute *CH7g* . . . . . 24770-1 — 1 gal; 24770-4 — 4 x 1 gal
Clear-Advantage is a specific fraction of petrochemical derivatives that creates a safer xylene substitute for processing, staining and coverslipping. There are several types of xylene substitutes in the market today including both standard hydrocarbon and citrus limonene types that contain overpowering odors. Clear-Advantage is virtually odorless and offers improved clearing performance compared to these types.

Benefits:

- Slides dry 3 times faster than with xylene
- Slides clear faster and crisper
- Paraffin dissolves 50% faster than with xylene
- Virtually odorless, low toxicity and stable
- Recycling is faster in conventional recycling units
- Decreases "tissue hardening"
- Compatible with automated processing units manufactured by TBS®, Leica, Sakura, Shandon, Lipshaw, Surgipath® and others
- Tissue morphology and cell structure definition is exceptional

Histology

	Catalog #	Size
Isopropanol Eosin Microwave Processing Solution	25407-1	1 liter
	25407-2	2 x 1 liters
	25407-19	19 liters

Proprietary formulation of Isopropanol Alcohol and Eosin solution for microwave processing. Reduces over-dehydration of small biopsies. Easily differentiate between Ethanol and Isopropanol, eliminating errors in dehydration order, that can permanently destroy specimens.

Benefits:

- Visually colors biopsies pink
- No more losing small biopsies
- Assists in identification of multiple pieces in cassettes

New! LopHene® ST *E4g* — 25990-1 — 24 x 1 oz case

LopHene® ST Sterile, low pH acidic detergent for cleanroom use. Concentrated formula is effective against a broad range of organisms including TB. LopHene® ST can be used alone or rotated with CiDecon® ST *(Cat. #25989)*. Dilution ratio: (1:256) 1 oz. Singlserv™ is pre-measured to make 2 gallons of working solution at the correct dilution. Conforms to OSHA's Bloodborne Pathogens Standard. Each case is shipped with a Lot Specific Document detailing parameters of QC, irradation and sterility. EPA registered.

Methyl salicylate [119-36-8] *HO5g* — 05943-1 — 1 kg; 05943-4 — 4 kg

(Methyl 2-hydroxybenzoate; Wintergreen oil) MW 152.15 bp 220 – 222°
Safe tissue clearing agent. Xylene substitute.
J. Histotech., 9, 27 (1986)

ParaClear Odorless Xylene Substitute *EH5g* — 22463-3.8 — 3.8 liters; 22463-4 — 4 x 3.8 liters

Naphtha-petroleum derivative that replaces xylene for clearing. It is odorless and presents a low hazard for routine histological processing and staining. ParaClear will remove alcohol during the final steps of routine tissue processing and is miscible with paraffin for infiltration. It has a higher flash point than xylene, reducing the flammability danger to the laboratory. Technical Data Sheet #671

Poly/Clear Solvent [5989-27-5] *EHO4g* — 17326-1 — 1 gal; 17326-4 — 4 gal

MW 136.2
A pleasant citrus odor replaces the strong xylene odor when you switch to Poly/Clear Solvent in your laboratory as your paraffin clearing agent. This low-toxicity material is for use in histology and cytology procedures when ever xylene is used. The high flash point and biodegradability of this product makes it an attractive alternative. Poly/Clear is miscible with solvent based mounting media and solubilizes both Polyfin® and Peel-A-Way®. Technical Data Sheet #301

Propylene Oxide, EM Grade [75-56-9] *BCHV6g* — 00236-1 — 1 pint

MW 58.08 bp 34° d 0.83 n_D^{20} 1.366 TSCA
Solvent used in the last stage of dehydration of tissue for epoxy embedding.
Requires Poison Pack

New! SaniHol ST 70% *CV5g* — 25769-12 — 12 x 16 oz; 25769-1 — 4 x 1 gal

Sterile, ready-to-use 70% denatured ethanol (EtOH) solution designed especially for cleanroom use. Filtered to 0.22µm, individually double-bagged and gamma-irradiated to ensure sterility. Made according to USP specifications and packaged in a Class 100 cleanroom. Each lot undergoes a bacterial endotoxin test to ensure that the product meets or exceeds "Water-for-Injection" quality in endotoxin limits and each lot also undergoes a USP 14-day sterility test. Each case is shipped with lot specific documentation which details QC, irradiation, sterility and bacterial endotoxin limits. Available in both non-aerosol trigger spray bottle and gallon size.

Histology

	Catalog #	Size
New! SporGone *A4g* Peracetic acid-based sterilizing and disinfecting solution provides high-level disinfection and is completely effective against spores. Ready-to-use solution is tuberculocidal, bactericidal, virucidal and fungicidal. Completely biodegradable, it decomposes into oxygen, water and acetic acid. FDA 510K clearance. Conforms to OSHA's Bloodborne Pathogens Standards.	25991-1	4 x 1 gal
Xylene, histology grade [1330-20-7] *CH5g* MW 106.17 Routine clearing agent. Also used with Canada balsam in oil-immersion microscopy. *Merck Index, 11, 9988*	08389-1	1 gal

Embedding

Paraffin

	Catalog #	Size
Embedding Mold Release Spray *G5g* Embedding Mold Release Spray is a particularly effective anti-stick agent that dries on contact and leaves no oily film. It is unaffected by water, oil, or solvents and is thermally stable to 500° F.	03928-1	10 oz. can
Peel-A-Way® Micro-Cut Preferred (DMF) Paraffin Micro-Cut Preferred paraffin, at 56° C – 58° C melt point is a new formulation with DMF (dimethylformamide) added to increase infiltration of tissue. This low polymer content formulation gives improved viscosity, infiltration, and embedding. The translucent appearance of the paraffin allows for excellent tissue visibility and easier paraffin removal with all types of clearing agents. Available in a larger, more convenient 10kg (22lb) case size containing four 2.5kg stand alone bags. One case will fill most tissue processors. Technical Data Sheet #525A	24198D-1	4 x 2.5 kg

Peel-A-Way® Micro-Cut Paraffins *A2g*
The low polymer formulation in our Peel-A-Way® paraffin line gives improved viscosity, infiltration and embedding. The translucent appearance of the paraffin allows excellent tissue visibility and easier paraffin removal with all types of clearing agents. Available in a larger, more convenient 10kg (22lb) case size containing four 2.5kg stand alone bags. One case will fill most tissue processors. Available in 3 melting temperatures, for a variety of tissue types. Technical Data Sheet #525A

52° C – 54° C	24201-1	4 x 2.5 kg
56° C – 58° C	24198-1	4 x 2.5 kg
62° C – 64° C	24202-1	4 x 2.5 kg

GemCut® Paraffin *A2g*
mp 56 - 58° C
A high polymer paraffin formulation for routine embedding and cutting. Specially formulated to exhibit superior cutting performance in high humidity environments, with low compression. Available in multiple colors to assist the histologic technician in visualizing small biopsies easily, even while using eosin, methylene blue or tissue marking dyes. Use colors to organize samples by technician or tissue type. Coloring agents and polymer content do not interfere with staining protocols or IHC. Technical Data Sheet #691

Amethyst	24366-1	4 x 2 kg
Citrine	24363-1	4 x 2 kg
Emerald	24364-1	4 x 2 kg
Opal	24365-1	4 x 2 kg
Pink Sapphire	24361-1	4 x 2 kg

Histology

	Catalog #	Size
PolyFin® Paraffin This is a mixture of fine paraffin waxes and copolymer alloys in convenient pellets. PolyFin. produces ultra-thin compression free ribbons. It is used to cut 2 micron sections routinely without icing. It functions flawlessly in pressure/vacuum fluid flow processors. PolyFin. provides maximum support for both hard and soft tissue samples while maintaining exceptional clarity. The low 55° C melting point eliminates excessive heat distortion during tissue processing. Technical Data Sheet #429	19562-1	8 x 1 kg

PolyGuard, Paraffin Repellent *EH5g* Xylene free paraffin repellent. Used to put a protective coating on surfaces exposed to paraffin as well as to clean adhering paraffin off laboratory countertops and equipment.	21168-120	120 ml
	21168-6	6 x 120 ml

Molds

Disposable Base Molds

Disposable base molds offer ease and convenience. Inexpensive enough to be discarded after use, yet strong enough to be reused. They offer excellent thermal exchange, and have a smooth interior finish and rounded corners to facilitate specimen removal. Made of PVC.

7 x 7 x 5 mm	25374-500	500 molds
15 x 15 x 5 mm	25375-500	500 molds
24 x 24 x 5 mm	25376-500	500 molds
30 x 24 x 5 mm	25377-500	500 molds
37 x 24 x 5 mm	25378-500	500 molds

Frozen

Mohs Lab Reagent Starter Kit All the reagents needed to start a complete MOH's lab. From cryotomy, fixation, staining and orientation, to the complete product of a finished slide that can be viewed within minutes.	25044-1	1 kit

Kit Contains:

- PolyFreeze Frozen Mounting Medium (case)
- Blue Tissue Marking Dye (2oz. bottle)
- Black Tissue Marking Dye (2oz. bottle)
- Green Tissue Marking Dye (2oz. bottle)
- Fast Frozen Stain Kit
- Differential Quik Stain Kit (250ml)
- Tissue Tack™ Microscope Slides – Plus (+) Glass (72 slides)
- Delicate Melanin Bleach Kit

Histology

Tissue Freezing Media

	Catalog #	Size
PolyFreeze - Five Color Kit *A2g*	25112-1	1 kit

Cryo-embedding matrix for frozen specimens. Color makes differentiating multiple specimens easy during sectioning and staining. Experience less curling, less ice artifacts, faster freezing with PolyFreeze. Freezes quickly supporting tissue for sectioning at 3µ and up with no cracking of the matrix at temperatures from -8° C to -25° C.

Kit Contains 4 oz. each of the following:

- Red
- Blue
- Yellow
- Green
- Clear
- Individual bottles also available in 4 oz. singles and 6 x 120ml cases.

PolyFreeze Replacement Bottles *A2g*
Technical Data Sheet #678

Blue	25116-4	4 oz
	25116-1	6 x 120 ml
Clear	19636-4	4 oz
	19636-1	6 x 120 ml
Green	25113-4	4 oz
	25113-1	6 x 120 ml
Red	25115-4	4 oz
	25115-1	6 x 120 ml
Yellow	25114-4	4 oz
	25114-1	6 x 120 ml

Molds

Peel-A-Way® Disposable Embedding Molds Sampler Pack	18646D-1	1 package

Easy to use and saves time - Unique design will Peel-A-Way from a solidified embedded block. There is no need for trimming. Can be used with Micro-Cut paraffin, JB-4®, GMA, Osteo-Bed, Osteo-Bed Plus and MMA embedding resins. Especially useful for frozen sections where orientation is critical and defrosting during transfer to cryostat chuck is an issue. Creates a buffer to allow the specimen to freeze to the chuck without defrosting the base. Technical Data Sheet #433

Sampler Pack contains the following:

- 18646C - Rectangular Molds R40 - 8 molds
- 18646B - Rectangular Molds R30 - 8 molds
- 18646A - Square Molds S22 - 16 molds
- 18986 - Truncated Molds T12 - 8 molds
- 18985 - Truncated Molds T8 - 8 molds

Histology

	Catalog #	Size
Individual Peel-A-Way® Embedding Mold Easy to use and saves time – Unique design will Peel-A-Way from a solidified embedded block. There is no need for trimming. Can be used with Micro-Cut paraffin, JB-4®, GMA, Osteo-Bed, Osteo-Bed Plus and MMA embedding resins. Especially useful for frozen sections where orientation is critical and defrosting during transfer to cryostat chuck is an issue. Creates a buffer to allow the specimen to freeze to the chuck without defrosting the base. Technical Data Sheet #433		
Rectangular – R30, 22mm wide x 30mm long x 20mm deep	18646B-1	288 molds
Rectangular – R40, 22mm wide x 40mm long x 20mm deep	18646C-1	264 molds
Square – S22, 22mm x 22mm square x 20mm deep	18646A-1	288 molds
Truncated – T12, 22mm x 22mm square truncated to 12mm x 12mm square, 20mm deep	18986-1	288 molds
Truncated – T8, 22mm x 22mm square truncated to 8mm x 8mm square, 20mm deep	18985-1	288 molds
Embedding Molds – Identification Tabs These specimen identification tabs can be placed in any paraffin embedding mold, but they were designed for our Peel-A-Way® mold system. Each individual tab measures 1cm high & 2cm in length. Each book contains 8,000 tabs.	19800A-1	1 book

Plastics

Resins & Catalyst

Araldite 502 Kit, Luft's Formula *EHJO7g* — 02600-1 — 1 kit

Viscosity Med.

Araldite 502 kit, Luft's Formula overcomes penetration difficulties by using propylene oxide as an additional clearing agent. Permits embedding of tissue from fixation to sectioning in about 24 hours. Technical Data Sheet #128

Kit Contains:

- 500g Araldite 502, 450g DDSA, 100g DMP-30 & Instruction sheet

J. Biophys. Biochem. Cytol., 9, 409 (1961)

Araldite 502/PolyBed® 812 Kit *EHJO7g* — 02595-1 — 1 kit

Mollenhauer suggested that hardness variation and penetration enhancement could be obtained by mixing Araldite and Epon resins. We offer Araldite 502 and PolyBed® 812 for researchers to utilize Mollenhauer's findings. PolyBed® 812 is an exact chemical match for Epon 812. Both Araldite 502 and Polybed® 812 are useful as an embedding medium with acetone or alcohol dehydration. Technical Data Sheet #128

Kit Contains:

- 500g PolyBed 812, 500g Araldite 502, 450g DDSA, 100g DMP-30 & Instruction sheet

Stain Tech., 39, 111 (1963)

Balsam, Canada, filtered [8007-47-4] *C4bg* — 01648-100 — 100 g; 01648-500 — 500 g

A natural resin used as mounting medium for microscopy.

Batson's #17 Anatomical Corrosion Kit *CFM7dw* — 07349-1 — 1 kit

Low viscosity, acrylic-based resin system for room temperature preparation of anatomical corrosion castings. After hardening, tissue is corroded away by caustic solution, yielding a durable, scientifically exact model for anatomical study. Technical Data Sheet #105

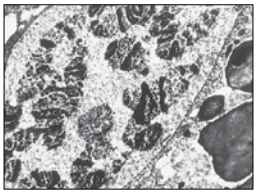
Kit Contains:

- 940ml monomer base, 2 x 100ml catalyst, 50ml promotor, 10g pigment red, pigment blue

Fahrenbach, W.H., et al., J. Elec Microsc. Tech., 10, 15 (1988); Pollitt, C.C. & Molyneux, G.S., Equine Vet. J., 22(2), 79 (1990); Redmond H. P. et al., Brit. J. Surgery, 76(2), 198 (1989)

Histology

	Catalog #	Size
Additional Kit Components: *CFM7dw* Technical Data Sheet #105		
Blue pigment	07352-100	100 g
Catalyst	02608-100	100 ml
Green pigment	07353-100	100 g
Maceration solution	07359-940	940 ml
Monomer base solution	02599-940	940 ml
Promoter	02610-50	50 ml
Red pigment	07350-100	100 g
White pigment	07351-100	100 g
Yellow pigment	07354-100	100 g
Benzil (Photopolymerization catalyst) *HU5g* MW 210.2 mp 95° TSCA $C_6H_5COCOC_6H_5$ UV polymerization catalyst. Technical Data Sheet #370	01946-25	25 g
Benzoin ethyl ether [574-09-4] *HV7ag* MW 240.3 mp 60° TSCA $C_6H_5CH(OC_2H_5)COC_6H_5$ UV polymerization catalyst.	01359-50	50 g
Benzoin iso-propyl ether [6652-28-4] *H5g* MW 254.3 mp 78° TSCA $C_6H_5CH[OCH(CH_3)_2]COC_6H_5$ UV polymerization catalyst.	00932-25	25 g
Benzoin methyl ether [3524-62-7] *H6g* MW 226.3 mp 47 – 49° TSCA $C_6H_5CH(OCH_3)COC_6H_5$ UV polymerization catalyst.	00425-10	10 g
Benzoyl peroxide, 70% active (water wet) [94-36-0] *FH4gp* MW 242.23 mp 105° TSCA $(C_6H_5CO)_2O_2$ Thermal polymerization catalyst.	21446-100	100 g
Benzoyl Peroxide, Plasticized [94-36-0] *GH5g* MW 242.23 $(C_6H_5CO)_2O_2$ Thermal polymerization catalyst. Appearance: Dry powder	24232-100	100 g
N,N-Benzyldimethylamine [103-83-3] *BEH6g* (BDMA; N,N-Dimethylbenzylamine) MW 135.21 mp 75° $C_6H_5CH_2N(CH_3)_2$ Low viscosity epoxy accelerator.	00141-100 00141-500	100 g 500 g
Dibutyl phthalate [84-74-2] *H4g* MW 278.4 bp 340° d 1.043 n^{20}_D 1.493 TSCA C_6H_4-1,2-$[CO_2(CH_2)_3CH_3]_2$ Plasticizer for polymers such as poly(vinyl chloride), poly(methyl methacrylate) and poly(vinyl acetate).	00434-450	450 g
Dibutyltin dilaurate [77-58-7] *BH6g* MW 631.6 mp 24° bp 205° d 1.066 n^{20}_D 1.470 TSCA $[CH_3(CH_2)_{10}CO_2]_2Sn[(CH_2)_3CH_3]_2$ Catalyst for polymerizing lactide and glycolide and isocyanate reactions. Appearance: Yellowish liquid	01862-50	50 g
Diethylene glycol distearate (DGD) *A2g* MW 639.07 A removable embedding medium for thin and thick sections. In thicker sections the exterior surface of mitochondria can be observed whereas in resin-embedded thin sections the mitochondria are most frequently observed in a cross section. DGD (diethylene glycol distearate) is used to prepare tissue for immunofluorescent localization of cytoskeletal components. It is also used for tissue preparation for in situ hybridization with nucleic acid probes. Technical Data Sheet #426 *Biochem. Cell Biol., 67, 242 (1989); Nature, 337, 454 (1989); J. Cell Biol., 98, 1978 (1984); 102, 1654 (1986)*	01873-500	500 g



Salivary Gland Cell from a Drosophila larva showing polytene chromosomes in the nucleus.

Histology

	Catalog #	Size
Dimethylaminoethanol (DMAE) [108-01-0] *BE6g*	01458-100	100 g
DMP-30 [90-72-2] *BH6g*	00553-100	100 g
Dodecenylsuccinic anhydride (DDSA) [19780-11-1] *H2g*	00563-450	450 g
	00563-4	4 x 450 g
Araldite resins (modified epoxy resins)		
Grade 502 WPE 233 – 250 [84-74-2] *HO5g*	00552-500	500 g
Grade 6005 WPE 182 – 189 [3101-60-8] *HO7g*	02116-500	500 g
Embed-It™ Low Viscosity Epoxy Kit [64-86-8]	24300-1	1 kit
Epon® Resin 828 [25068-38-6] *HO2g*	02334-500	500 g
Epon® Resin 1001F [25036-25-3] *HO2g*	24305-500	500 g
Epoxy Resin Removal Kit	21487-1	1 kit

Dimethylaminoethanol (DMAE) [108-01-0] *BE6g*
MW 89.14 bp 130° – 136° TSCA $HOCH_2CH_2N(CH_3)_2$
Curing agent for epoxy resins.

DMP-30 [90-72-2] *BH6g*
MW 265.4 bp 316° Viscosity ~200 cps n^{20}_{D} 1.515 TSCA
$[(CH_3)_2NCH_2]_3C_6H_2OH$
Curing catalyst for epoxy resins. Appearance: light yellow to yellow liquid

Dodecenylsuccinic anhydride (DDSA) [19780-11-1] *H2g*
MW 266.38 bp 181°/5mm d 1.005 Viscosity 440 cps n^{20}_{D} 1.479 TSCA
Epoxy hardener, suitable for use in embedding procedures.

Araldite resins (modified epoxy resins)
TSCA C_6H_4-1,2,-$[CO_2(CH_2)_3CH_3]_2$
Technical Data Sheet #128

Embed-It™ Low Viscosity Epoxy Kit [64-86-8]
A modification of the Spurr's formulation, Embed-It™ Low Viscosity Epoxy Kit can be used for embedding biological, material and mineralogical samples. This kit is composed of two very low viscosity components (~65cps) packaged in easy to dispense squeeze top bottles. Components are mixed in equal parts by weight to make the infiltration and embedding resin. The resin readily penetrates into the specimen and cures to a clear hard solid overnight at 60° C. Technical Data Sheet #622

Benefits:

- Easy To Use – Mix Only 2 Components in Equal Proportions
- Save Time – Prepare the Embed-It™ Resin for Both Infiltration and Embedding
- Convenient – Mix Only the Amount You Need
- Less Hazardous – Components Ship Together As Non-Hazardous Materials

Epon® Resin 828 [25068-38-6] *HO2g*
(Bisphenol A diglycidyl ether) MW ~377 Viscosity 10,000 – 16,000 cps WPE: 185 – 192 TSCA
Standard epoxy resin used in formulation, fabrication and fusion technology. Widely used for embedding and potting. When cross-linked or hardened with appropriate amine curing agents, very good mechanical adhesive, dielectric and chemical resistance properties are obtained.

Epon® Resin 1001F [25036-25-3] *HO2g*
(Bisphenol A diglycidyl ether) MW 1,075 Viscosity 7.0 – 9.6 cps @ 25% solid WPE: 525 – 550
Higher MW epoxy resin cured by amine catalyst and used for embedding.
Appearance: White to pale yellow solid

Epoxy Resin Removal Kit
Quickly removes epoxy resin from thin sections in five minutes under mild conditions preserving delicate immunogenicity of specimens.
Technical Data Sheet #440

Kit Contains:

- 100ml of solution A
- 3ml of solution B

Stain Tech. 65, 205 (1990); Mikroscopie, 42, 315 (1985)

Histology

	Catalog #	Size
ERL-4221 [2386-87-0] *HO4g*	24738-250	250 g

MW 252.3 g/mole bp (760 mm Hg) > 250° C $C_{14}H_{20}O_4$
Freezing Point: -35° C Specific Gravity: (20° C) ~1.17 ERL-4221 is a cycloaliphatic, diepoxy functional organic compound that is a useful building block in the production of semi-hard to hard cured epoxy resins. It is incompatible with amines, acids and strong bases and will cure to form a resinous product. ERL-4221 is often used in manufacture of plastic embedding kits for electron microscopy. Appearance: transparent, low color viscous liquid

Ethylene glycol diglycidyl ether (Quetol 651) [2224-15-9] *H5g*	01479-100	100 g

MW 174.2 bp 112°/4.5mm n^{20}_{D} 1.463 TSCA
Crosslinker for carboxyl-, amine- and hydroxyl- functional polymers. Material is ~100% active and contains higher molecular weight compounds having chloropropylene segments produced by reaction with more than one epichlorhydrin molecule per hydroxyl in synthesis.
Histochemical Journal, 20, 222 (1988)

Immuno-Bed Kit *FGH06g*	17324-1	1 kit

Designed for use with immunohistochemistry (IHC) studies. The system allows adequate penetration of small molecular weight antibodies and chromogens, such as aminoethylcarbazole (AEC). Large molecular weight molecules may not stain well, even after etching the plastic from the section. Sections should be completed and stained as soon as possible after polymerization is complete, within 2 – 3 days. Immuno-Bed is a glycol methacrylate based embedding kit with performance similar to JB-4® and JB-4 Plus® in tissue infiltrations, embedding and cutting procedures. The embedded blocks are clear for excellent tissue visibility. Polymerization at 0 – 4° C is recommended to reduce the heat generated by the exothermic reaction. Technical Data Sheet #302

Kit Contains:

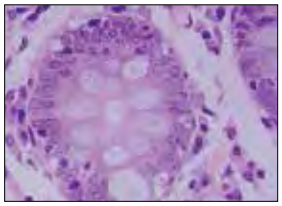
- 800ml Solution A, 30ml Solution B, 12g Benzoyl Peroxide Plasticized

Additional Immuno-Bed Kit Components

Immuno-Bed Benzoyl Peroxide Plasticized (Catalyst) *FHG5g*	17325C-12	12 g
Immuno-Bed solution A *HO4g*	17325A-800	800 ml
Immuno-Bed Solution B *A2g*	17325B-30	12 ml

JB-4® Embedding Kit *HGO6g*	00226-1	1 kit

Water-soluble, GMA based, plastic resin kit intended for use in the preparation of embedded samples for high-resolution light microscopy. Widely used for research and clinical diagnosis. JB-4® yields semi-thin sections (0.5μ – 2μ) with excellent morphological preservation. Clear casts are obtained in 90 minutes or less at room temperature. JB-4® is the leading water-soluble plastic embedding kit for light microscopy. It has been successfully used in enzyme histochemistry and auto-radiography. Technical Data Sheet #123



Colon tissue embedded in JB-4®,stained with H&E, 40X, 2μm

Kit Contains:

- 800ml Solution A, 30ml Solution B and 12g Catalyst

Am. J. Clin. Path., 73, 121 (1980); 76, 5 (1981); Stain Technol., 54, 5 (1979); J. Histochem., Cytochem., 31, 417 (1983); J. Histotech., 4, 59 (1981)

JB-4® Embedding Kit Replacement Bottles

Benzoyl Peroxide Plasticized (Catalyst) *GH5d*	02618-12	12 g
Solution A (Monomer) *HO5d*	0226A-800	800 ml
	0226A-3.8	3.8 liters
Solution B (Accelerator) *2d*	0226B-30	30 ml

Histology

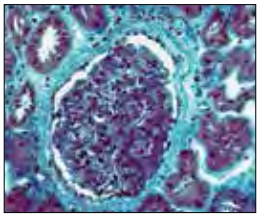
	Catalog #	Size
JB-4® Mini Embedding Kit *GHO6d*	22507-1	1 kit
JB-4 Plus® Embedding Kit *GH5d*	18570-1	1 kit
Benzoyl Peroxide Plasticized (Catalyst) *GH5d*	18570C-8	8 g
Solution A (Monomer) *HO5d*	18570A-500	500 ml
Solution B (Accelerator) *2d*	18570B-15	15 ml
Lowicryl®HM 23 Non-polar, hydrophobic, -80° C Embedding Kit *CHIR7c*	18162-1	1 kit
Lowicryl® K11M Polar Kit, hydrophilic, -60° C Embedding Kit *HIR7ag*	18163-1	1 kit
Lowicryl®HM 20 Non-polar, hydrophobic, -70° C Embedding Kit *HIR7ag*	15924-1	1 kit
Lowicryl®K4M Polar Kit, hydrophilic, -35° C Embedding Kit *HIR7ag*	15923-1	1 kit
Methyl Methacrylate Embedding and Casting Kit *CHOV7m*	23679-1	1 kit

JB-4® Mini Embedding Kit *GHO6d*
A pre-measured and ready-to-use version of the JB-4® Kit.
Technical Data Sheet #494

Kit Contains:

- 2 – 40ml Embedding Solution A, 2ml Embedding Solution B and 0.50g Benzoyl Peroxide Plasticized

JB-4 Plus® Embedding Kit *GH5d*
JB-4 Plus® offers all the benefits of JB-4®, plus some added features: cooler acting accelerator system for greater protection of tissue components; yields crystal clear non-yellowing blocks; the blocks resulting from JB-4 Plus® are ideal for processing dense material such as bone. GMA based plastic such as regular JB-4® cannot be removed from sections and is not recommended for IHC. Technical Data Sheet #393



JB-4 Plus® Section, Kidney glomerulus

Kit Contains:

- 500ml Solution A, 15ml Solution B, 8g Benzoyl Peroxide and Catalyst

JB-4 Plus® Embedding Kit Replacement Bottles *HO4d*
Technical Data Sheet #393

Lowicryl®HM 23 Non-polar, hydrophobic, -80° C Embedding Kit *CHIR7c*
Kit Contains:

- 3 x 225 gm of monomer G, 1 x 40gm of crosslinker F, 1 x 3.7gm of initiator C and 1 x 5.5gm of initiator J

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl® K11M Polar Kit, hydrophilic, -60° C Embedding Kit *HIR7ag*
Kit Contains:

- 3 x 250gm of monomer I, 1 x 40gm of crosslinker H and 1 x 4.3 gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl®HM 20 Non-polar, hydrophobic, -70° C Embedding Kit *HIR7ag*
Kit Contains:

- 3 x 225gm of monomer E, 1 x 130gm of crosslinker D and 1 x 4.8gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl®K4M Polar Kit, hydrophilic, -35° C Embedding Kit *HIR7ag*
Kit Contains:

- 1 x 130gm of crosslinker A, 3 x 250gm of monomer B and 2 x 4.8gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Methyl Methacrylate Embedding and Casting Kit *CHOV7m*
Resin cures thermally (preferably under pressure) under anaerobic conditions and is capable of producing the highest quality hard, clear, colorless castings.

Kit Contains:

- 3 kg methyl methacrylate, 1 kg poly(methyl methacrylate) powder and 30 g catalyst

Histology

	Catalog #	Size
Methyl Methacrylate-Butyl Methacrylate Embedding Kit *HU7g*	03573-1	1 kit

For electron microscopy. Can be used to embed tissue for thin or thick sectioning. By varying butyl methacrylate amount in embedding mix, block hardness is changed. Can be UV catalyzed. Technical Data Sheet #408

Kit Contains:

- 2 x 500g of methyl methacrylate, 1 x 500g of butyl methacrylate, 1 x 8g benzoyl peroxide, plasticized 70% & 1 x 10g benzoin methyl ether

MonoStep™ Lowicryl® Embedding Media *CHO6d*

Pre-mixed, ready to use, saves time and minimizes chemical contact. These products are ideal for use in Immunohistochemistry. They are based on our popular Lowicyrl® K4M and HM-20 formulations for low temperature embedding or freeze substitution. MonoStep™ products are especially appropriate for immunolableing resulting in better preservation of antigenicity and lower background labeling.

HM-20 Non-polar	23994-225	225 g
K4-M Polar	23646-225	225 g

Nadic Methyl Anhydride (NMA) [25134-21-8] *adm*	00886-450	450 g

MW 178.2 n_D^{25} 1.505

Liquid anhydride for curing epoxy resins. This material is a mixture of methyl isomers of methylbicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic anhydride. The larger the proportion of NMA used in the epoxy resin formula, the harder the resultant block. Technical Data Sheet #PDS 890 and #PDS 892

Osteo-Bed Bone Embedding Kit *GH5d*	17734-1	1 Kit

Formulated for embedding large and small mineralized (undecalcified) bone specimens. Large bone samples embedded with Osteo-Bed should be sectioned with a heavy-duty microtome. Small bone and soft tissue should be sectioned with a microtome designed to cut plastic embedded materials. Osteo-Bed is a methyl methacrylate-based material that can be removed from the section and allows the use of staining procedures very much like a paraffin section. Not water-soluble.

Kit Contains:

- 900ml Osteo-Bed Resin Solution A, 2 x 12gm Benzoyl Peroxide and Plasticized (Catalyst)

Additional Osteo-Bed Bone Kit Components:

Benzoyl Peroxide Plasticized (Catalyst) *GH5g*	17734C-2	2 x 12 g
Resin Solution A *CHO5g*	17734A-900	900 ml
Solvent *HVWX6g*	17734B-4	4 x 500 ml

Osteo-Bed Plus Embedding Kit *CGHO5g*	24889-1	1 kit

Offers the same benefits as Osteo-Bed Bone Embedding Kit with the added benefit of producing much harder blocks for supporting undecalcified bone specimens and bone containing metal implants, grafts and stents. Suitable for use with large and small mineralized (undecalcified) bone sections and hard tissues. Try Osteo-Bed Bone Embedding Solvent *(Cat. #17734B)* to remove plastic from sections for brilliant staining.

Poly/Bed® 812 Embedding Kit / BDMA (Glauert Version) *BHOV7m*	21844-1	1 kit

This kit configuration provides even lower viscosity, and faster diffusion and penetration, than the standard Luft formulation.
Technical Data Sheet #471

Kit Contains:

- 1 x 200ml Poly/Bed 812, 1 x 160ml Dodecenyl Succinic Anhydride (DDSA), 1 x 100ml Nadic Methyl Andydride (NMA) & 1 x 20ml BDMA (Benzyl dimethyl amine)

Histology

	Catalog #	Size
Poly/Bed® 812 Mini Kit/BDMA (Glauert Version) *BHOV7m*	21959-1	1 kit

This kit configuration provides even lower viscosity, and faster diffusion and penetration, than the standard Luft formulation.
Technical Data Sheet #472B

Kit Contains:

- 1 x 50ml Poly/Bed 812
- 1 x 40ml DDSA
- 1 x 25ml NMA
- 1 x 5ml BDMA

Poly/Bed® 812 Embedding Media *H4g*	08791-500	500 g

Viscosity 100 – 200 cps TSCA
Epoxy resin for embedding. Cured by amine catalysts. Exact WPE number supplied on label, ranging from 140 – 160. Technical Data Sheet #233

Poly/Bed® 812 (Luft formulations) Embedding Kit / DMP-30 *BHOV7g*	08792-1	1 kit

Technical Data Sheet #233

Kit Contains:

- 1 x 500gm Poly/Bed 812
- 1 x 450g Dodecenyl succinic anhydride (DDSA)
- 1 x 450g Nadic Methyl anhydride (NMA)
- 1 x 100g DMP-30

Poly/Bed® 812 (Luft formulations) Mini Kit *BHOV7g*	21958-1	1 kit

Technical Data Sheet #472A

Kit Contains:

- 50ml Poly/Bed 812
- 30ml DDSA
- 20ml NMA
- 5ml DMP-30
- Instructions

Poly/Bed® Araldite 502 Mini Kit *EHJO7g*	21960-1	1 kit

Technical Data Sheet #472C

Kit Contains:

- 1 x 30g Poly/Bed 812
- 1 x 15g Araldite 502
- 1 x 55g DDSA
- 1 x 5ml DMP-30

Mollenhauer, Stain Tech., 39, 111 (1964)

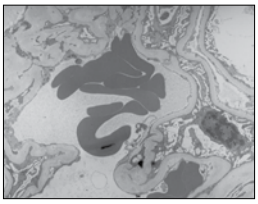
PolyCut-Ease *A2g*	18615-100	100 ml

The addition of 1% PolyCut-Ease to any epoxy embedding recipe will enable many stress free sections to be cut from a single area of a knife. It preserves the life of your diamond knife edge as it markedly reduces friction of the knife as it cuts through the plastic. The additive will not change the block color or EM image quality. Does not contain Silicone. Technical Data Sheet #385
H.J. of EM Tech., 3, 217 (1986)

Histology

	Catalog #	Size
Spurr Low Viscosity Embedding Kit *HMV7g*	01916-1	1 kit

Exceptional penetration for tissue, mineral, and dense structures. A low viscosity of 60 cps allows easy penetration into a variety of difficult materials. May be used to prepare mineral specimens for polishing. The low viscosity of the Spurr formulation allows rapid infiltration into tissues, minerals and other dense structures. Facilitates embedments with high lipid contents or hard membranes or highly vacuolated *parenchymatous* tissues. Technical Data Sheet #127



Microscopic blood clot in glomerulus of the human kidney after transplant. Courtesy of P.Wills, Harris Medical Labs

Kit Contains:

- 450g NSA
- 250g ERL 4221
- 250g D.E.R. 736
- 100g DMAE

Spurr Low Viscosity Mini Kit *HMV7g*	21961-1	1 kit

Exceptional penetration for tissue, mineral, and dense structures. A low viscosity of 60 cps allows easy penetration into a variety of difficult materials. May be used to prepare mineral specimens for polishing. The low viscosity of the Spurr formulation allows rapid infiltration into tissues, minerals, and other dense structures. Facilitates embedments with high lipid contents or hard membranes or highly vacuolated *parenchymatous* tissues. Technical Data Sheet #127

Kit Contains:

- 55ml NSA
- 20ml ERL-4221
- 12ml DER736
- 1ml DMAE
- 3 x 10ml syringes
- 1 x 5ml graduated syringe
- 2 wooden mixers

Ultra Low Viscosity Embedding Kit *EHOV7g*	17706-1	1 kit

ERL-4221 is useful for rapid embedding of materials which are difficult to infiltrate even with Spurr's resin. Exhibits good sectioning qualities, beam stability, and staining properties. Miscible with alcohol or acetone so propylene oxide can be avoided. For EM and LM – **NOT water soluble**.

Kit Contains:

- 1 x 100g ERL-4221
- 2 x 00g Octenyl Cuccinic Anhydride (DSA)
- 1 x 25g 1,4-Butanediol Diglycidyl Ether (BDE)
- 1 x 100g Dimethylaminoethanol (DMAE).

Unicryl™ Resin *EMU6f*	22770-250	250 ml

A unique, largely hydrophilic, acrylic resin, developed for universal use in LM and EM applications. When fully polymerized, Unicryl demonstrates excellent cutting characteristics. Sectioning surface follows the contours of the tissue during cutting action, producing a highly exposed surface of proteins and nucleic acids for subsequent immunohistochemistry techniques. Resin preserves these structures without interacting or cross-linking with them. Provides optimum sectioning and staining for animal, plant and microbiological tissues for Light Microscopy and Electron Microscopy. Unicryl is provided as a ready-to-use single solution. No mixing required. Resin remains liquid to -30° C, Stable for one year at 4° C.

Pancreas, 1µm section Polychromatic Stain

Histology

Molds

	Catalog #	Size
BEEM® Embedding Capsules, Size 00	00224-100	100 caps
	00224-500	500 caps
	00224-1000	1000 caps

Polyethylene BEEM® capsules are the most commonly used embedding capsules for all types of resins. The embedding block requires little or no trimming. The closed capsules are UV transparent for polymerization of acrylics. In addition to the two standard 3 and 00 sizes, we have the conical and bottle-necked 00 sized designs for centrifuged material embedding. These capsules can withstand up to 600 G. Use with JB-4®, Immuno-Bed (GMA), Osteo-Bed, Osteo-Bed Plus (MMA) and other resins that do not polymerize well in conventional silicone rubber molds.

BEEM®, Flat, Transparent — 23257-1 — 1 mold

Manufactured from transparent polyethylene. Useful for embedding media such as JB-4®, glycol methacrylate and other methacrylates which do not polymerize well in conventional silicone rubber molds. The transparency of the mold permits accurate specimen orientation when illuminated from below. The molds are flexible and reusable. Each mold is supplied in a protective plastic case.

Dimensions: 2.54mm x 5.33mm x 12.32mm

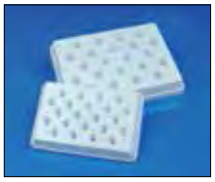
BEEM® Embedding Capsules

Polyethylene BEEM® capsules are the most commonly used embedding capsules for all types of resins. The embedding block requires little or no trimming. The closed capsules are UV transparent for polymerization of acrylics. In addition to the two standard 3 and 00 sizes, we have the conical and bottle-necked 00 sized designs for centrifuged material embedding. These capsules can withstand up to 600 G. Use with JB-4®, Immuno-Bed (GMA), Osteo-Bed, Osteo-Bed Plus (MMA) and other resins that do not polymerize well in conventional silicone rubber molds.

Size 00 bottle necked capsules	00295-100	100 caps
Size 00 conical capsules	00294-100	100 caps
Size 3 capsules	00336-100	100 caps

BEEM® Capsule Holders

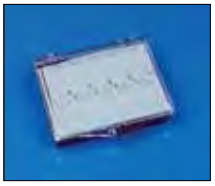
For holding capsules upright during polymerization. Holds 22 capsules in numbered cavities. Made from an epoxy resistant material that embedding media will not stick to. Also suitable for gelatin capsules. Cavities may be illuminated from below to facilitate specimen orientation.



Size 00, regular (heat curing) for capsules	0256A-3	3 holders
	0256A-12	12 holders
Size 3, regular (heat curing) for capsules	0256B-3	3 holders
	0256B-12	12 holders

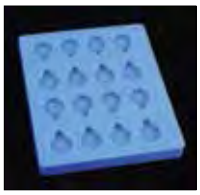
BEEM® Embedding Capsules, Block Storage Box — 03604-10 — 10 boxes

Holds up to 10 polymerized size 00 blocks in numbered compartments. Contained in a protective hinged case to avoid dust contamination.



Chien Embedding Molds, Universal — 19440-1 — 1 mold

Allows up to 16 tissue samples to be sectioned both on lateral and transverse planes without re-embedding. Can also be used as a general flat embedding mold. Casts made from this mold can be used on Leica/ Reichert, LKB and most EM Microtomes with flat embedment chucks. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit.



Histology

	Catalog #	Size

Embedding Mold Trays

For JB-4®, JB-4 Plus®, Immuno-Bed, L.R.-White®, L.R.-Gold® or Paraffin embedding. This is an embedding system of reusable molds and trays with colored stubs.

12mm x 8mm	23184-1	100 molds
16mm x 8mm	23185-1	100 molds
19mm x 13mm	23186-1	100 molds
10mm thick – mixed	23197-1	100 stubs
4mm thin – white	23189-1	100 stubs
Embedding Mold Trays	23188-1	10 trays

Embedding Molds - Multispecimen, Flat - Opaque . . . . . 23261-1 1 mold

This mold contains 20 shaped cavities plus 8 oblong cavities 3.5mm wide in three different lengths. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit.

Dimensions: 113mm x 17mm

Embedding Molds – Silicone, Flat, Numbered Cavities – Opaque . . . . . 23258-1 1 mold

Produced from opaque silicone rubber. Durable and flexible with 21 consecutively numbered shaped cavities. Molds have high thermal and chemical resistance. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit.

Mold dimensions: 69mm x 90mm

Cavity dimensions: 5mm x 12mm x 4mm

Embedding Molds – Silicone, Flat, Polysciences . . . . . 02615-1 1 mold

Flexible silicon rubber mold, releases up to 21 blocks by flexing. Reusable and can be used to store material prior to sectioning. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit.

Cavity dimensions: 5mm x 12mm x 4mm deep

Embedding Molds – Silicone, Round . . . . . 23260-1 1 mold

For use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kits for large or odd shaped specimens. Embedded blocks are 14mm in diameter. Up to six blocks per mold.

Gelatin Embedding Capsules

Economical and convenient method for producing resin blocks. UV transparent, ideal for UV Polymerization of acrylic resins. Can be used with most resins. Capsules have snap-shut lids which cannot slide off accidentally. Capsules are also useful for storing grids and TEM calibration specimens.

Gelatin, Size 00 (23.3mm long x 8.18mm wide; 0.95ml volume)	00225-1000	1000/pk
Gelatin, Size 1 (19.0mm long x 6.63mm wide; .50ml volume)	07347-1000	1000/pk
Gelatin, Size 4 (13.9mm long x 5.05mm wide; .21ml volume)	07348-1000	1000/pk

Histology

	Catalog #	Size
JB-4 Aluminum Chuck (11mm shaft, 10mm diameter) Reusable aluminum chuck supplied complete with thumbscrew. Designed for use with our Plastic Block Holders *(Cat. #15899)* and molding trays. Compatible with: Hacker, A/O Reichert rotary and Autocut, JB-4 and JB-4A, LKB Ultratomes and Shandon Hypercut.	15901-1	1 unit
JB-4® Plastic Block Holders Easy to store plastic block holders for resin. Matte surface for easy marking and a large center hole to prevent bubble formation. Block Holders fit securely onto molding cup tray cavities. Attach to Polysciences' reusable chucks designed for commonly used microtomes.	15899-50	50 holders
Micron Micromolds Embedding Capsules Self supporting unit of 10 size 00 conical end capsules in numbered positions for economical embedding. The Capsules are self supporting and do not require additional holders. The mold is made from polyethylene and gives pre-shaped blocks with 1mm square tips similar to BEEM® capsules. The blocks are easy to remove and require little or no final trimming. Use with JB-4®/JB-4®Plus, Osteo-Bed/Osteo-Bed Plus and other GMA or MMA resins.	08408-50	50 units

Polyethylene Molding Cup Trays
Light-weight, durable plastic trays, ideal for resin molding specimen blocks with JB-4® and other resins. Use in conjunction with Polysciences' popular and inexpensive block holders and chucks. Also use with Immuno-Bed, L.R. White, L.R. Gold, Micro-Cut and GemCut® paraffins.

6 x 12 x 5mm (20 cavities)	16643A-1	1 unit
12 x 16 x 5mm (20 cavities)	16643B-1	1 unit
6 x 8 x 5mm hexagon (9 cavaties) – Set of 3	17177A-3	3 trays
2 x 15 x 5mm (9 cavities) – Set of 3	17177B-3	3 trays
13 x 19 x 5mm (9 cavities) – Set of 3	17177C-3	3 trays

Additional Embedding Media

PEG 4000 Resin [25322-68-3] *A2g* — 16861-250 — 250 g
mp 53 – 56° C
This water soluble, nonionic material is used like paraffin to infiltrate and embed tissue. Easily removed from sections with 95% ethanol for immunocytochemical and x-ray microanalytical techniques.Technical Data Sheet #279
J. Cell Biol., 95, 101a (1982); Biol. Cell, 44, 85 (1982)

Poly(ethylene glycol) (n) distearate [9005-08-7] *A2g*
Soluble in IPA, hot water, mineral oil. TSCA $CH_3(CH_2)_{16}CO(OCH_2CH_2)_nO_2C(CH_2)_{16}CH_3$
Waxy, water dispersible solid. n = value is MW of PEG unit.

MW 200	mp 32 – 36°	02298-100	100 g
		02298-500	500 g
MW 400	mp 35 – 37°	01048-100	100 g
		01048-500	500 g
MW 6,000	mp 52 – 57°	19234-100	100 g

Histology

	Catalog #	Size
Poly(ethylene glycol) (n) distearate, Flaked [9005-08-7] *A2g* . . . . . MW 6,000 mp 52 – 57° $CH_3(CH_2)_{16}CO(OCH_2CH_2)_nO_2C(CH_2)_{16}CH_3$ n = 6,000 A removable embedding medium for thin and thick sections. In thicker sections the exterior surface of mitochondria can be observed whereas in resin-embedded thin sections the mitochondria are most frequently observed in a cross section. Used to prepare tissue for immunofluorescent localization of cytoskeletal components. It is also used for tissue preparation for in situ hybridization with nucleic acid probes. *Biochem. Cell Biol., 67, 242 (1989); Nature, 337, 454 (1989); J. Cell Biol., 98, 1978 (1984); 102, 1654 (1986)*	25096-100	100 g
Quetol 651 Embedding Kit *HO7g* . . . . . Fast penetrating epoxy embedding medium for EM and LM. Water miscible. Polymerized blocks section easier than in ordinary epoxy resin mixture and show excellent electron image contrast. Acts as a dehydrating agent. Technical Data Sheet #297 Kit Contains: • 1 x 100ml Quetol 651 • 1 x 250g NSA • 1 x 30ml DMP-30	16908-1	1 kit

Microtomy

Microscope Slides & Coverslips

Microscope Control Slides . . . . . A new approach to control slides. This slide allows the control specimen and the Patient's specimen to be on the same slide with positive identification of both specimens. Identical Patient and Control stain procedures. The slide has a frosted end for easy marking and special coating for enhanced sample adhesion to the slide.	24012-1	72 slides
Microscope Slides, Frosted . . . . . Frosted on one end to be thumb detectable when working in a dark room.	21911-1	72 slides
Microscope Slides, Micropure . . . . . Manufactured with optical quality pure glass, Micropure slides Contain 47% less iron than water white slides. This allows visualization of true sample color. Slides have better hydrolytic resistance-resist leaching/clouding and feature increased wettability.	22245-1 22245-10	72 slides 1440 slides
Microscope Slides, Plain . . . . . Made of high quality glass guaranteed to be precleaned. The slides are ground smooth and free of sharp cutting edges.	07441-1	72 slides
Poly-L-Lysine Coated Microscope Slides [12236-82-7] . . . . . Slides are coated with Poly-L-Lysine to permit electrostatic coupling of sample to slide. The relative adhesion level permits easier manipulating of samples than with silane coated slides. Use of Poly-L-Lysine Microscope Slides does not affect staining procedures. Technical Data Sheet #518 Dimensions: 25mm x 75mm x 1mm	22247-1	72 slides
Super Frosted Microscope Slides . . . . . These slides have a special coating impervious to processing reagents, which allows for more permanent marking.	21912-1	72 slides

Histology

	Catalog #	Size
Tissue Tack™ Microscope Slides - Plus (+) Glass	24216-1	72 slides

Treated with a specially formulated aminoalkylsilane, Tissue Tack slides provide a positively charged surface, which permits instant coupling of negatively charged tissue sections. The resultant bond stands up to the very aggressive solutions used in In-Situ Hybridization procedures. Slides are available with a white label. Technical Data Sheet #518

New! Tissue-Guard™ Coverslipping Film	25737-1	1 roll
	25737-5	5 rolls

Tissue-Guard™ coverslipping film provides efficiency and standard in the high pace laboratory. The special designed plastic film provides exceptional clarity while protecting your specimen for long term storage. It is a safer alternative to glass coverslips. No breaking of coverslips or constant refilling of coverslip needed. Each roll of coverslipping film is 70 meters and can coverslip up to 1,200 slides. Save time in your day by using Tissue-Guard™; the smart choice for your coverslipping needs. Tissue-Guard™ is compatible with all automated coverslippers requiring plastic film tape. For *In Vitro* Diagnostic use.

Quartz Coverslips

Made from GE 124 quartz.

Round, 1.0" (25.4 mm) Diameter, Thickness #2 (0.2 mm)	24964-1	1 coverslip
Square, 1.0" (25.4 mm), Thickness #1 (0.15 to 0.18 mm)	24968-1	1 coverslip
Round, 0.984" (25 mm) Diameter, Thickness #1 (0.15 to 0.18 mm)	24967-1	1 coverslip
Square, 1.0" (25.4 mm x 25.4 mm), Thickness #2 (0.2 mm)	24966-1	1 coverslip
Round, 1.300" (33.02 mm) Diameter, Thickness #2 (0.2 mm)	24965-1	1 coverslip
Square, 0.984" (25 mm), Thickness #0 (0.075 to 0.125 mm)	24969-1	1 coverslip

Microscope Slide Coverslips, Glass

11mm x 22mm - 324 coverslips	03929-1	1 box
22mm x 22mm - 162 coverslips	21913-1	1 box
22mm x 30mm - 119 coverslips	23999-1	1 box
24mm x 40mm - 82 coverslips	24070-1	1 box
24mm x 50mm - 65 coverslips	24071-1	1 box
24mm x 60mm - 54 coverslips	24072-1	1 box

Quartz Microscope Slides

High quality, state of the art family of clear fused quartz based microscope slides. Recommended for most applications involving chemical microscopy, in order to be sure that nothing is lost due to absorption in a glass slide. The use of quartz slides and coverslips are also recommended whenever UV microscopy is contemplated, including UV confocal microscopy because of the high UV transparency of quartz.

1" x 1" (25.4 x 25.4 mm) x 1 mm Thick	24957-1	1 slide
1" x 1" (25.4 x 25.4 mm) x 0.5 mm Thin	24961-1	1 slide
1" x 2" (25.4 x 50.8 mm) x 1 mm Thick	24958-1	1 slide
1" x 3" (25.4 x 76.2 mm) x 1 mm Thick	24959-1	1 slide
1" x 3" (25.4 x 76.2 mm) x 0.5 mm Thin	24963-1	1 slide
1" x 2" (25.4 x 50.8 mm) x 0.5 mm Thin	24962-1	1 slide
2" x 3" (50.8 x 76.2 mm) x 1 mm Thick	24960-1	1 slide

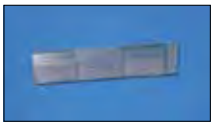
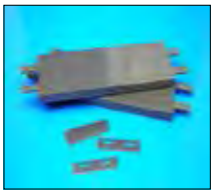
Histology

	Catalog #	Size
Microscope Slide Coverslips, Plastic . . . . . Dimensions: 22mm x 22mm x 0.157mm thick	16601-1	1000/box
PolyGlass Coverslipping Medium *CH6g* . . . . . Viscosity 149 cps Non-water soluble toluene based liquid coverslipping media designed to eliminate the use of coverslips. Non-yellowing, and scratch resistant, Polyglass simplifies the protection of prepared slides. The refractive index is near 1.48 and can be removed if necessary by soaking in toluene or xylene. Ideal for uneven thick sections that cause air bubbles under a coverslip with routine procedures. Technical Data Sheet #432	22253-120 22253-6	120 ml 6 x 120 ml
Gelatin [9000-70-8] *A2g* . . . . . Used for slide preparation for light microscope autoradiography and histochemistry. To make gelatin solution: to 500ml of D.I. water at 60° C add 0.5g gelatin and stir to dissolve. After the gelatin is dissolved add 0.05g of chromium potassium sulfate and let mixture cool to 40° C. Dip nitric acid cleaned slides into warm gelatin mixture and dry in clean environment. Store prepared slides in clean slide box.	00639-100	100 g

Blades, Knives & Accessories

Cryostat Blade Holder . . . . . These attach to a blade holder and bring the convenience of a disposable cutting system to the Miles Tissue-Tek Cryo System. No adapter is required for most other cryostats.	22230-1	1 holder
Diamond Knives Polysciences has been selling diamond knives to satisfied users for over 20 years. We guarantee your satisfaction. These are the highest quality diamond knives available and can be repeatedly resharpened. See website for additional ordering information. Technical Data Sheet #261		
Standard 2.0mm edge length	08452-1	1 knife
Standard 2.5mm edge length	08453-1	1 knife
Standard 3.0mm edge length	08454-1	1 knife
Standard 3.5mm edge length	08455-1	1 knife
Standard 4.0mm edge length	18383-1	1 knife
Glass Knife Storage Box . . . . . A useful way of storing triangular glass knives. The silicone rubber insert in the plastic box will hold ten 25mm (1 inch) knives firmly in position.	16659-1	1 box
Glass Scoring Jig . . . . . An aid for producing 25.4mm glass knives by hand method. When the edge of the T square is placed against the edge of the glass strip the subsequent score will be 25.4mm long. After breaking, the square of the glass can be scored at 45° using the other jig. Used in conjunction with our diamond glass scriber *(Cat. #03636).*	23274-1	1 unit
Glass Scriber, Diamond . . . . . Natural Diamond at 90° angle in a metal mounting. It is fitted with a protective cover and pocket clasp. Useful for scoring glass strips prior to hand making glass knives, marking slides and property identification.	03636-1	1 unit

Histology

	Catalog #	Size
Glass, Ultra Microtome High quality, clean glass strips cut to close size requirements to ensure they will fit all knifemakers. Glass is pre-cleaned and individually wrapped. Available in a variety of sizes and thicknesses for both ultramicrotomy and histology, as well as Ralph knives.		
100mm x 50mm x 12mm thick	19748-1	20 strips
380mm x 25mm x 6mm thick	08421-10	10 strips
	08421-30	30 strips
380mm x 38mm x 6mm thick	16844-20	20 strips
Microtome Blade Holder . . . . . . An all stainless steel microtome blade holder which is our standard workhorse and has been proven over time. Does not require maintenance and has a five year guarantee. 	22229-1	1 holder
Microtome Blades, Disposable – AO/Reichert . . . . . . Shur/Sharp blades represent the ultimate in technology. Chatterless & compression-free ribbons will become routine for all types of tissue. For use with AO/Reichert or other high profile blade holders.	22080-1	50 blades
Microtome Paraffin Section Anti-Roll Device . . . . . . Prevents rolling of sections as they come off the microtome blade. It is a unique design which positions a clear plastic plate above the blade to prevent sample curling. It has a magnetic attachment system – "snap on or off".	22227-1	1 unit
Microtome Blades, Disposable – Heavy Duty . . . . . . Shur/Sharp blades represent the ultimate in technology. Chatterless & compression-free ribbons will become routine for all types of tissue. For use with AO or other high profile blade holders.	22380-1	35 blades
Single Edge Razor blades, individually wrapped	08410-1	100 blades
Tungsten Carbide Blades, Disposable . . . . . . 100% solid high grade tungsten carbide. Recommended for hard tissue, bone or material embedded in MMA or GMA, frozen.	24234-1	3 blades
Tungsten Carbide Knives, Triangular . . . . . . Excellent for sectioning hard samples, GMA, Epoxy resins. Replace glass and razor blades in a variety of sectioning and block facing applications. Durable edge lasts through thousands of sections, eliminating mid-procedure knife changes, enhancing productivity. Fits tightly in the glass knife holders of most microtomes. 3 knives per package.	24233-1	3 knives
Vibratome Injector Blades . . . . . . Disposable Injector blades for Vibratome, uncoated carbon. 	22370-1	1000 blades

Histology

Solutions for Microtomy Problems

	Catalog #	Size
Histoheme *A2g*	24774-250	250 ml

Developed to assist histologists with bloody specimens such as placental fragments, bone marrow biopsies, liver, spleen and endometrial curettings which tend to harden after processing and dry out. These tissues, when set on ice tend to shatter and flake leaving blood fragments all over the work area, microtome, water bath and have a high potential for creating extraneous tissue "floaters" on slides. Technicians can cut clean, non-fragmented sections without stopping in-between each block with Histoheme. Technical Data Sheet #763

Benefits:

- Ammonia based emollient
- Alleviates problems and mess associated with working with bloody specimens
- Creates long clean paraffin ribbons without stopping to clean between each block
- Greater morphological staining

PolyGuard, Paraffin Repellent *EH5g*	21168-120	120 ml
	21168-6	6 x 120 ml

Xylene free paraffin repellent. Used to put a protective coating on surfaces exposed to paraffin as well as to clean adhering paraffin off laboratory countertops and equipment.

Soft Block [9003-04-7] *A3g*	24616-500	500 ml
	24616-1	1 gal

Unique formula for softening difficult to cut tissue in paraffin. Effective on bone, nails and tissue. Easy to use, just soak pre-trimmed block surface in Soft Block for 5 – 15 minutes (depending on tissue sample size) and cut sections. Soft Block is environmentally safe, special waste disposal is not required and will not damage equipment. Technical Data Sheet #718

Soft Nail *AH4g*	24775-250	250 ml

Unique Formulation to Soften Keratin
Made for very hard complex keratinized hair, nail and skin samples common in Mohs Histology laboratories. Hair, nail and skin samples that have been processed tend to flex and turn becoming difficult to cut and hold on slides for staining. Processing hardens these samples and presents the challenge of cutting complete sections or sections without a "Venetian Blind Effect".

Benefits:

- Easy to use – no mixing required
- Keratinized samples cut & stain with greater ease
- Prevents shredding and tearing of samples
- Alleviates samples from folding on slides
- Breaks down the fibrous structural protein of hair, nail, hoof, feathers and skin

Total Cutting Solution Kit	25388-1	1 kit

Our Total Cutting Solution Kit provides you with 5 tissue cutting solutions to address decalcification issues and difficult tissue blocks & specimens. Reduce bottlenecks in your workflow by using the 10 multi-well tissue block holders provided with the kit right at your cutting station!

Kit Contains:

- Histoheme, Soft Block, Soft Nail, Super Decalcifier I: Delicate, Super Decalcifier II: Heavy Duty and 10 multi-well block holders

Histology

Catalog #	Size

Wrinkle Out Water Bath Solution . . . . . .

25383-1	1 gal
25383-2	2 x 1 gal

Use in place of normal or distilled water for water bath when cutting paraffin sections and pick up wrinkle free ribbons and sections on the slide. May be used in place of normal water bath fill solution. Changes the water surface tension so tissue spreads evenly without wrinkles when using paraffin that is of lower quality than the polymer fortified paraffins on the market. For best results set water bath temperature at 34 - 38° C. For our Tissue Flotation Water Bath *(Cat. #25389), see page #71.*

Top: wrinkled and compressed paraffin ribbon placed in normal water bath filled solution. Bottom: paraffin ribbon in Wrinkle Free Water Bath Solution. Wrinkles disappear and compression is gone, allowing the tissue to flatten due to the change in water surface tension.

Mounting Media

Adhesive, Tissue-Tack *H5gm* . . . . . .

16672-100	100 ml
16672-500	500 ml

For adhering tissue sections to slides during immunostaining and routine histology staining procedures. Technical Data Sheet #289

Stain Technol., 6, 358 (1982)

Aqua-Poly/Mount *A2d* . . . . . .

18606-20	20 ml
18606-100	100 ml
18606-5	5 x 20 ml

Viscosity 390 cps n_D^{20} 1.454 – 1.460

Water-Soluble, Non-Fluorescing Mounting Medium. Formulated for mounting sections from aqueous solutions. Useful for immunofluorescent techniques as it enhances and retains fluorescent stains. Aqua-Poly/Mount can also be used for frozen sections, fat stains and immuno-stains when aqueous mounting media is required. Use Aqua-Poly/Mount with most fluorescent dyes and stains including DAB, Alkaline Phosphatase-Fast Red, AEC (aminoethylcarbozle) and a variety of other chromogens. Can be removed from slides by soaking in water. Supplied in convenient 20ml squeeze bottles. Technical Data Sheet #521

Cedarwood oil *EH2ag* . . . . . .

04851-4	4x100 g

n_D^{20} approx. 1.519

Used as immersion oil for light microscopy and for clearing microscope sections.

CitraMount™ Medium *CH5g* . . . . . .

24214-100	100 ml
24214-500	500 ml

Viscosity 90 cps n_D^{20} 1.484

This butyl acetate and acrylic mixture is the first mounting medium developed that allows coverslipping directly from d-limonene based clearants. Superior results are also obtained with xylene. Recommended for manual coverslipping only as it may cause damage to the valves of automated coverslippers. Get a clear seal and decrease your drying time to less than 24 hours. Technical Data Sheet #603

CMCP macroinvertebrate mounting media *BHX6g*

n_D^{20} 1.41

Colorless non-resinous, water miscible mounting medium for permanent transparent mounts. It can be used like Canada Balsam, but CMCP resin has the advantage of allowing live or preserved specimens to be mounted directly from water or alcohol. Useful in mounting free living nematodes and live parasitic worms. Requires Poison Pack. Technical Data Sheet #259

Histology

	Catalog #	Size
CMCP-10, High viscosity mountant	16300-250	250 ml
	16300-500	500 ml
CMCP-9, Low viscosity mountant	16299-100	100 ml
	16299-500	500 ml

Immersion Oil – Fluorescence Microscopy – Type LDF . . . . . 25354-1 1 oz
25354-4 4 oz

Polysciences, PCB-free immersion oils are available according to your specific application. Manufactured by Cargille. Has highest resolution, but slight green range background fluorescence. Replaces type DF

Immersion Oil – Fluorescent Microscopy – Type FF *A3g* . . . . . 23993-1 1 oz
23993-4 4 oz

Immersion Oils – Light microscopy *A2g*
PCB-free immersion oils are available according to your specific application. For short focus objective.

Type A viscosity 150 centistokes	08582-120	1 oz
	08582-4	4 oz
Type B viscosity 1250 centistokes	08583-120	1 oz
	08583-4	4 oz
Type NVH viscosity 21000 centistokes	23991-120	1 oz
	23991-4	4 oz

Mowiol® 4-88 [9002-89-5] *U5g* . . . . . 17951-500 500 g
17951-1 1 kg

MW ~31,000 88% hydrolyzed

Mowiol® 4-88 is a high quality embedding medium for immunofluorescence and molecular biology applications. When hardened it has the same refractive index as immersion oil. If used for Immunofluorescence applications the addition of glycerin is recommended. Mowiol® 4-88 can be made an anti-fade medium through the addition of p-phenylenediamine.
Technical Data Sheet #777

Cell, 18, 375 (1979); The Journal of Histochemistry and Cytochemistry, 41(12), 1833 (1993); Cytometry Part A, 52A, 90 (2003)

Plastic UV Mount Mounting Media *HO5g* . . . . . 16866-100 100 ml

Viscosity 28 cps n^{20}_{D} 1.45

Designed for coverslipping epoxy, methacrylate, and deparaffinized sections directly from water or alcohol. Plastic UV Mount matches the refractive index of JB-4 embedded sections, since the JB-4 embedding resin is not removed prior to staining. Methacrylate based Plastic UV Mount avoids optical distortion and improves the final image. When applied to sections with a small amount of xylene, Plastic UV Mount "hardens" permanently within 2 minutes with exposure to long UV light, thus obviating leaching of stains. Slides must be coverslipped for viewing. Technical Data Sheet #432

Poly-Mount® *CH5g* . . . . . 08381-120 120 ml
08381-940 940 ml

Viscosity 192 cps n^{20}_{D} 1.484

A crystal clear xylene based medium providing superior optical clarity and preserving most biological dyes with little or no fading when slides are stored in light tight containers. The viscosity permits bubble-free applications with minimal spreading and excellent adhesion of coverslips. Poly-Mount® is perfect for mounting and long term storage. It is non-water soluble, miscible with tolune and xylene. Technical Data Sheet #432

Histology

	Catalog #	Size
Poly-Mount Xylene *CH6g*	24176-120	120 ml
	24176-940	940 ml

Viscosity 107 cps n^{20}_{D} 1.48

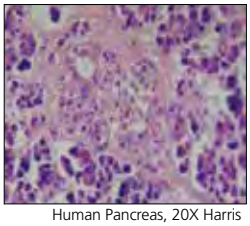
Xylene based routine coverslipping medium for histology and cytology slides. This acrylic medium provides superior optical clarity. Poly-Mount Xylene is recommended for automated coverslipping instruments that use both glass and tape coverslips. It contains an anti-fade agent to prevent fading and yellowing with long term storage. Dries quickly for viewing, storage and filing. Technical Data Sheet #432

Staining

Routine Stains

Ammonium Blue *H4g* — 24819-1 — 1 gal

Very rapid formulation for bluing hematoxylins in only 3 minutes. Ammonium Blue is buffered at an alkalinity of (pH = 10.0). Our premixed and ready-to-use Ammonium Blue provides crisp nuclear detail obtained with Hematoxylin and Eosin stains. For use in both Cytology and Histology.

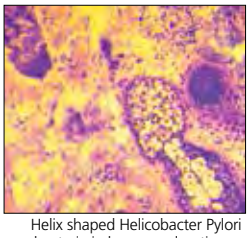


Human Pancreas, 20X Harris Hematoxylin, Eosin Y

Differential Quik Stain Kit (Modified Giemsa) — 24606-250 — 250 ml; 24606-500 — 500 ml

High quality, rapid turnaround staining kit that serves many purposes in the cost conscious laboratory environment. May be used for rapid blood smears for differential assessment, as well as detecting *H. pylori* microorganisms. The stain is very useful to pathologists for immediate interpretation of fine needle aspiration biopsies. Fast alternative to Wright-Giemsa staining procedures. Technical Data Sheet #715

Diagnosis of Pneumocystis jirovecii pneumonia by bronchoalvolar lavage in AIDS patients. Comparison of Diff-Quik, fungifluor stain, direct immunofluorescence test and polymerase chain reaction; Acta Cytol, 1995 Nov-Dec, 39(6) 1089-93 2. Diff-Quik Stain as a Simplified Alternative to Papanicolaou Stain for Determination of Quality of Endocervical Specimens Submitted for PCR Detection of Chlamydia trachomatis; Journal of Clinical Microbiology, Oct 1996, p. 2590-2592ii



Helix shaped Helicobacter Pylori bacteria in human colon tissue.

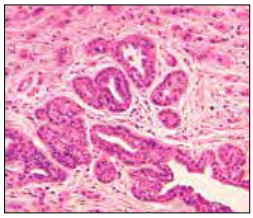
Eosin Y, 0.5% alcoholic solution, Acidic *C5g* — 09859-500 — 500 ml; 09859-1000 — 1000 ml; 09859-3.75 — 3.75 liters

Used as counterstain with hematoxylin; contains acetic acid. Does not contain isopropanol or methanol. Ready to use with any automated stainer.

Human kidney tissue stained with Harris Hematoxylin and Eosin Y.

Eosin Y, 1% alcoholic solution, Non-Acidic *CH5g* — 17269-500 — 500 ml; 17269-1000 — 1000 ml

Contains no acetic acid. Used as counterstain with hematoxylin. Ready-to-use with any automated stainer.



Human Breast Duct Carcinoma, Harris Hematoxylin and Eosin Y, 1% alcoholic solution, ammonia water bluing solution. 10X magnification.

Histology

	Catalog #	Size
Eosin Y, C.I. 45380, certified [17372-87-1] *U5g* (Eosin yellowish; Acid red 87; 2′,4′,5′,7′-Tetrabromo-fluorescein, disodium salt) MW 691.9 Cytoplasmic counterstain. Component of Wright stain and MacNeal's Tetrachrome stain.	02740-50	50 g
Fast Frozen Stain Kit Rapid staining method for frozen sections. Process is suitable for Laser Capture Microdissection (LCM). Technical Data Sheet #716	24604-1	1 kit

Kit Contains:

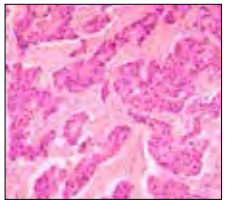
- Fast Fix Frozen Fixative, Gill's Hematoxylin #3, Eosin Y 0.5%, Scott's Bluing Reagent and CitraMount™ Mounting Media.

Dyes & Stains

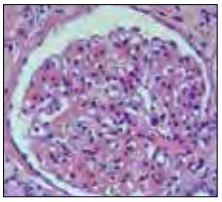
	Catalog #	Size
Gill's Hematoxylin #1 for Cytology *A2g* Gold Standard Gill's #1 is ideal for routine cytology staining. This single strength formulation optimally stains gynecological and non-gynecological specimens. Technical Data Sheet #192	24242-500	500 ml
	24242-1000	1000 ml

Human cheek cells, Gill's #1, Gill's Modified EA, Gill's Modified OG-6

	Catalog #	Size
Gill's Hematoxylin #2, double strength for Histology & Cytology *A2g* Gold Standard Gill's #2 should be used when a stronger or darker nuclear stain is required for cytology samples. Preferred for immunohistochemical counterstaining of the nucleus. General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Technical Data Sheet #192	24243-500	500 ml
	24243-1000	1000 ml

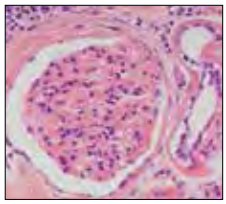


	Catalog #	Size
Gill's Hematoxylin #3, triple strength for Histology *A2d* Gold Standard Gill's #3 is the formulation of choice for routine histological staining when a darker nuclear stain is desired. General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Technical Data Sheet #192	24244-500	500 ml
	24244-1000	1000 ml



Kidney stained with Gill's Hematoxylin #3, Eosin Y, 20X, 4

	Catalog #	Size
Harris Hematoxylin, Acidified (mercury-free) *H2g* Polysciences, Inc. Gold Standard Series Hematoxylin and Eosin products offer you the highest quality for routine staining. Strict quality control for all Gold Standard Series Routine Stains ensures lot-to-lot consistency. Packaged in convenient plastic recyclable containers. General purpose nuclear stain, regressive type. Used with hematoxylin and eosin staining. Use Gold Standard Harris Hematoxylin for routine histology and cytology. Similar results can be achieved to those of Gill's Hematoxylin #1, #2 and #3 formulations by varying staining times. Technical Data Sheet #776	24245-500	500 ml
	24245-1000	1000 ml



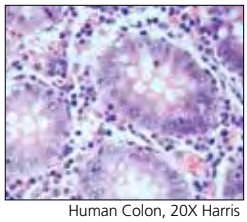
Human Kidney, 20X Harris Hematoxylin, Eosin Y

	Catalog #	Size
Hematoxylin, C.I. 75290, certified (Natural black 1) [517-28-2] *A2g* MW 302.3 Nuclear protein stain and glycogen stain. Also a general tissue stain for human, animal and VIR histology. *Stain Technol., 14, 47 (1930); 62, 181 (1987)*	02749-25	25 g
	02749-100	100 g

Histology

	Catalog #	Size
Lithium Blue *H4g*	24820-1	1 gal

Lithium Blue is a gentle yet rapid formulation of bluing hematoxylins in only 5 minutes. Lithium Blue is buffered at an alkalinity of pH = 8.0 Our premixed and ready to use Lithium Blue provides crisp nuclear detail obtained with Gills, Mayers and Harris Hematoxylin stains. For use in both Cytology and Histology.



Human Colon, 20X Harris Hematoxylin, Eosin Y

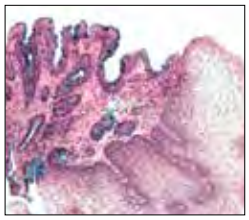
Mayer's Hematoxylin *H4g*	24821-500	500 ml
	24821-1	1 liter

For use in both cytology and histology. General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Used as a counterstain for immunohistochemistry procedures.

Special Stains

Alcian Blue/PAS Kit *d*	25086-1	1 kit

Demonstrates neutral and acidic mucosubstances on tissue at pH 2.5 and imparts a blue color to the acidic mucins and other carboxylated or weakly sulphated acid mucosubstances. Periodic Acid Schiff (PAS) reaction is then used to stain basement membranes, glycogen and neutral mucosubstances pink to red. Mixtures of neutral and acidic mucosubstances will appear purple due to positive reactions with both Alcian Blue and PAS. Requires cold pack Charge & Overnight Shipping. Store in cold box. Technical Data Sheet #886



Kit Contains 500ml each of the following:

- Alcian Blue, 1% in 3% Acetic Acid, Periodic Acid 0.5%, Harris Hematoxylin, Scott's Bluing & Schiff's Reagent

Amyloid Stain Kit (Congo Red)	24614-1	1 kit

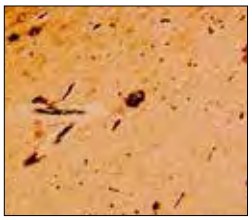
Complete kit to aid in the staining of tissue for Amyloidosis. Used in the detection of amyloid FFPE as well as frozen tissue sections cut at 10 microns. The amyloid stains red and the nuclei stains blue. Control tissue is Alzheimer's or other known amyloidosis.

Biebrich Scarlet – Acid Fuchsin Solution, Ready-to-Use	24602-100	100 ml

(1% Acetic Acid, .9% Biebrich Scarlet, .1% Fuchsin) For use in Masson Trichrome stain procedure.

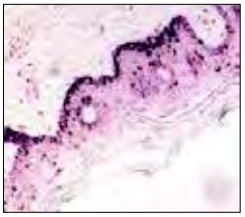
New! Bielschowsky's Stain	25994-250	250 ml
	25994-500	500 ml

Silver stain used to demonstrate the presence of senile plaques and neurofibrillary tangles in Alzheimer's disease. Used on FFPE sections cut at 8-10 microns. Senile plaques, neurofibrillary tangles and axons stain dark brown to black.



Fontana Masson Stain Kit	25104-1	1 kit

Intended for the use in the histological visualization of Argentaffin cells and Melanin in paraffin or frozen sections. Technical Data Sheet #893



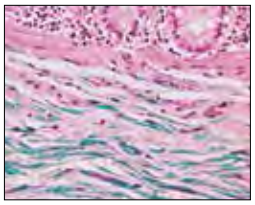
Kit Contains:

- 500ml – 10% Silver Nitrate
- 500ml – 0.1% Gold Chloride
- 100ml – 28-30% Ammonium Hydroxide
- 500ml – 1% Nuclear Fast Red
- 500ml – 5% Sodium Thiosulfate.

Histology

	Catalog #	Size
Gomori's Trichrome Stain Kit	24205-1	1 kit

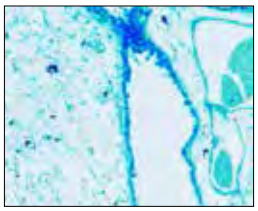
Gomori's One Step Trichrome refers to the multiple stain action of this reagent only. The mordant is Bouin's Fixative *(Cat. #16045)*. All components and counterstains are included in kit. Technical Data Sheet #389



Human colon tissue stained with Gomori's Trichrome Stain Kit.

Grocott Methenamine Silver Stain (GMS) for Fungus & PCP	25087-1	1 kit

(Room Temperature & Microwave Kit)
Chromic acid oxidation forms aldehydes from fungal cell wall polysaccharide components, which are subsequently demonstrated by reduction of an alkaline hexamine-silver complex. The reaction may be compared to that of the Periodic Acid Schiff reaction.
Technical Data Sheet #864



Kit Contains:

- Chromic Acid Soln.Sodium Metabisulfite
- 5% Silver Nitrate
- Methenamine Soln.
- 5% Borax
- 0.2% Gold Chloride
- 2% Sodium Thiosulphate
- Light Green stock soln.

Gum mastic [61789-92-2] *A2g*	19329-100	100 g

mp 80 – 83°
Used in staining technique for Steiner and Dieterle's spirochete stain.
Histotechnology A Self Instructional Text, 2nd ed., ASCP Press, Chicago, 1997 p. 200-202.

Hydroxynapthol Blue, ACS [165660-27-5]	25000-25	25 g

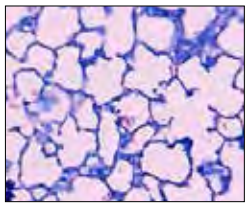
MW 620.47 $C_{20}H_{12}N_2Na_2O_{11}S_3$
Stain is suitable for calcium determinations.

Leishman Stain [12627-53-1]	25001-25	25 g

Leishman stain is used for staining bone marrow and blood smears to identify leucocytes, malarial parasites and trypanosomas.

Light Green Counterstain Stock Solution, 0.5% *A5dx*	25117-100	100 ml

Economical BSC certified stock solution that allows end users to control the final concentration of the working Light Green SF solution, as well as maintain control of staining times. Light Green SF is used as counterstain for staining paraffin sections and paraffin blocks for PAS-Fungus, GMS-PCP tissue sections. Light Green SF solution can also be used as a substitute for aniline blue Masson's Trichrome Stain and as a counterstain in paraffin sections for IHC.



Pas-Fungal Stain. The Light Green counterstain background enhances the fungal elements which are stained magenta.

Luxol Fast Blue (Solvent Blue 37) [12226-74-3] *U2g*	00805-25	25 g

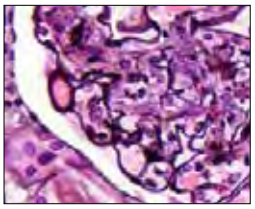
Used to stain myelin and phospholipids.
Salthouse, Stain Technology, 37, 313 (1962)

Luxol Fast Blue, Ready-to-Use *CH4g*	24611-500	500 ml

Used to stain myelin and phospholipids.

Histology

	Catalog #	Size
Jones PAS-M Stain Kit	25091-100	100ml
	25091-500	500ml

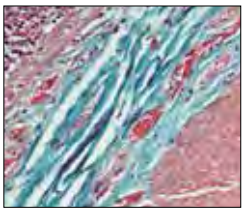


Periodic Acid Schiff Methenamine Silver Stain for Basement Membranes. A new and improved Jones PAS-M technique that utilizes an enhancer to accelerate the methenamine silver reaction with the glomerular basement membranes, while reducing the time to achieve results better than the original Jones PAS-M and a more stabilized silver solution. Used in kidney biopsies, Jones PAS-M may also be used for plastic sections for glomerular and tubular basement membranes. Technical Data Sheet #868

Kit Contains:

- 0.5% Periodic Acid
- 0.5% Thiosemicarbazide
- 5% Silver Nitrate Stock
- 3% Methenamine
- 3% Borax
- 0.2% Gold Chloride
- 2% Sodium Thiosulphate
- Nuclear Fast Red

Masson's Trichrome Stain Kit	25088-100	100ml Kit
	25088-1	500ml Kit



Used for the detection of collagen fibers in tissues such as skin, heart, etc. on formalin-fixed, paraffin-embedded sections and may be used for frozen sections as well. Collagen fibers stained blue, nuclei stained black and cytoplasm, muscle, erythrocytes stained red. Technical Data Sheet #872

Kit Contains:

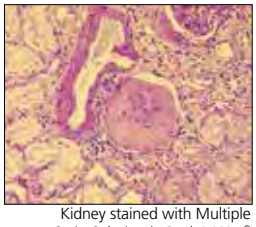
- 100ml / 500ml – Bouin's Fixative
- 75ml / 250ml – Weigert's Iron Hematoxylin Soln A
- 75ml / 250ml – Weigert's Iron Hematoxylin Soln B
- 100ml / 500ml – Biebrich Scarlet-Acid Fuchsin
- 100ml / 500ml – Phosphotungstic/Phosphomolybdic Acid
- 100 ml / 500ml – Aniline Blue
- 100 ml / 500ml – 1% Acetic Acid, Aqueous

Methyl purple indicator, aqueous solution [1340-02-9] *A2g*	15040-1	1 liter

pH 4.8 (purple) to pH 5.4 (green) For water analysis with ASTM Std., D1067.

Multiple Stain Solution (Paragon) *C5g*	08824-100	100 ml
	08824-500	500 ml
	08824-1000	1000 ml

(Paragon Stain)



Kidney stained with Multiple Stain Solution in Peel-A-Way® Micro-Cut Paraffin, 4u, 10X

Used in Tzanck preparations of herpetic lesions and differentiates acidophilic and basophilic structures. Multiple Stain is a replacement for the former Paragon Multiple Stain (PMS). Can be directly applied to frozen sections, epoxy, JB-4® embedded sections or paraffin. It is utilized as a general cytoplasmic and nuclear stain. Multiple Stain also differentiates various cytologic processes including basal cell carcinoma, squamous cell carcinoma, malignant melanoma, B-cell lymphoma, acute myelomonocytic leukemia and metastatic breast cancer. Multiple Stain Solution is an easy to use, one step procedure with H & E quality staining. Technical Data Sheet #269

Histology

	Catalog #	Size
Neat Stain Trichrome Stain Kit *CH5g*	25035-1	1 kit

For staining stool specimens. Based upon the Wheatley Trichrome technique which is a rapid staining procedure providing very optimal results for routine examination. Simplified method – use of a mordant prior to staining is not necessary. Neat Stain offers the flexibility of a three dip staining sequence in both the stain and counter-stain solution.

Benefits:

- Neat – Self-contained foil sealed, pre-filled multi-well containers
- Fast – Immerse slides sequentially in each reagent for specified time, air dry and read
- Convenient – Additional foils for re-sealing containers

Kit Contains:

- 3 Reagent Packs
- Plastic Stand
- 6 Reclosure foils

New! Oil Red O Staining Kit	25962-100	100 ml

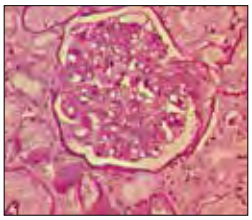
Oil Red O staining procedure provides excellent demonstration of fat and lipids in frozen tissue sections. Stains up to 100 slides.

Kit Contains:

- 100 ml Oil Red O Solution
- 200 ml Propylene Glycol
- 100 ml Hemotoxyline

Periodic Acid Schiff's (PAS) Stain	24200-1	1 kit

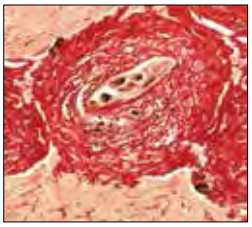
PAS techniques are used to demonstrate polysaccharides, neutral mucosubstances and basement membranes primarily in tissue. The PAS reagent is also called Fuelgen Stain for the demonstration of DNA with a different protocol. Kidney is the most sensitive control. The demonstration of glycogen is best represented by a section of liver with a digestion step used as a negative control for staining. Kit is supplied with Harris' Hematoxylin Acidified *(Cat. #24245)* as a counterstain.
Technical Data Sheet #602



Human kidney tissue stained with Periodic Acid Schiff's Stain Kit (PAS).

Picrosirius Red Stain Kit	24901-250	250 ml
	24901-500	500 ml

Our Picrosirius Red Stain binds specifically to collagen fibrils of varying diameter that is used to distinguish collagen Type I from Type III. Picrosirius Red Stain will quantify the amount of collagen in a given area of myocardial tissue. (i.e. the collagen area fraction) Collagenous structures of the mandible stain brilliant red. Unlike sections stained with hematoxylin and eosin alone, dentinal tubules, Sharpey's fibers and other structures can be seen clearly after using Picrosirius Red Stain procedure. Under polarized light, collagen fibers can be specifically identified and their orientation determined.



Puchtler et al., 1973; Junqueira et al., 1979

Poly G Blue, Ready-to-Use Stain *CH4ag*	24609-500	500 ml

Poly G is a eady-to-use Coomassie® G250 blue stain solution for protein electrophoresis staining applications. Convenient 500ml size saves time and preparation costs. Ready-to-use format eliminates exposure to potentially irritating powdered dyes.

Histology

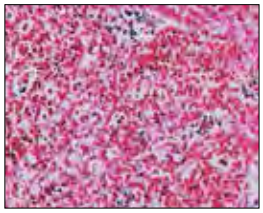
	Catalog #	Size
Poly R Blue, Ready-to-Use Stain *CH4ag*	24608-500	500 ml
Prussian Blue Iron Stain Kit (Reaction for Demonstration of Iron) *H4g*	24199-1	1 kit
Rapid Mucin Stain Kit	24208-1	1 kit
New! Rapid PTAH Stain Kit	25715-250 25715-500	250ml 500 ml
Reticulin Stain Kit	25094-250 25094-500	250 ml 500 ml

Poly R Blue, Ready-to-Use Stain *CH4ag*

Ready-to-use Coomassie® R250 blue stain solution for protein electrophoresis staining applications. Our ready-to-use format eliminates exposure to potentially irritating powdered dyes. Convenient 500ml size saves time and preparation costs.

Prussian Blue Iron Stain Kit (Reaction for Demonstration of Iron) *H4g*

Prussian Blue or Perls' reaction is used to demonstrate ferric iron and ferritin. This is not a true staining technique rather, it is a histochemical reaction. The protein is split off by the hydrochloric acid, allowing the potassium ferrocyanide to combine with the ferric iron. This forms the ferric ferrocyanide or Prussian Blue. Technical Data Sheet #601



Human kidney tissue stained with Prussian Blue iron Stain Kit.

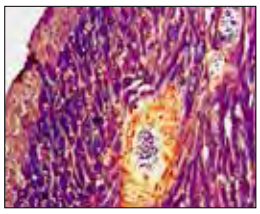
Rapid Mucin Stain Kit

Secretions of mucins are produced in several areas including epithelial and connective tissue. Inflammation can cause secretion of mucin as well as some types of intestinal carcinomas. The use of a Rapid Mucin stain will quickly determine the presence of mucin and assist in the direction of other special stains or immunohistochemistry to determine the origin of the mucin producing cells. The entire kit procedure takes 12 to 15 minutes after paraffin removal. Technical Data Sheet #600

Human colon tissue. stained with Rapid Mucin Stain Kit.

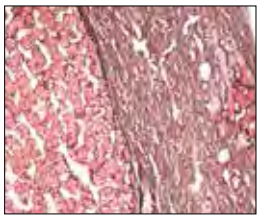
New! Rapid PTAH Stain Kit

PTAH is used to demonstrate cross-striations of the skeletal muscle as well as fibrin and collagen. Used on formalin fixed, paraffin embedded tissue (FFPE). Muscle striations, fibrin and nuclei stain various shades of blue. Collagen, reticulum, basement membranes and cartilage stain various shades of red to red-brown.



Reticulin Stain Kit

Identifies reticulin fibers in tissue sections liver, kidney and spleen. Reticulin is a type III collagen found in the basement membrane of many organs and provides structural integrity. Reticulin Stain Kit is a metal impregnation technique, where ammoniacal silver initially binds to the tissue component of interest, the reducing agent (formalin) produces a dark insoluble precipitate, then treated by toning and fixing in sodium thiosulfate.
Technical Data Sheet #876



Kit Contains:

- 1% Potassium Permanganate
- Oxalic Acid, 2.5% Ferric Ammonium Sulfate
- 0% Silver Nitrate
- 28 – 30% ACS Ammonium Hydroxide
- 3% Sodium Hydroxide
- 0% Formalin Aqueous Soln.
- .2% Gold Chloride
- 5% Sodium Thiosulfate
- 1% Nuclear Fast Red Stain Soln.

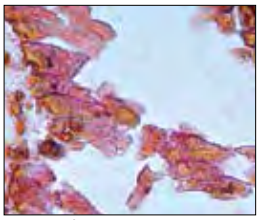
Histology

	Catalog #	Size
Ruthenium red [11103-72-3] *H5g* . . . . . MW 858.42 Stain for polysaccharides and for elastic fiber in tissue. Also a myoneural junction stain. *J. Cell Biol., 57, 874 (1973)*	01098-1	1 g
Saffron [42553-65-1] . . . . . Saffron is used in a variety of histological staining methods including the Hematoxylin, Phloxine and Saffron (HPS) staining technique. The HPS stain demonstrates collagen in connective tissues. Hematoxylin, stains acidic structures such as DNA, purple. Phloxine, stains most proteins pink and Saffron stains collagen yellow.	25007-25	25 g
Silver Enhancement Kit for LM *B4d* . . . . . Two component kit for use with both 1nm & 5nm immunogold labels which gives excellent results with silver enhancement. Adequate amplification is usually obtainable in a period of 5-10 minutes and can be monitored on a microscope. The enhancement is performed by mixing together one drop of each solution on a slide.	22708-1	1 kit
Silver Nitrate [7761-88-8] *BG6g* . . . . . MW 169.89 Equal to or better than ACS specifications. Silver stain techniques are widely used to detect nanogram quantities of proteins following electrophoresis. Silver nitrate is the silver source in most silver stain procedures. Assay: 99.9% min. *Anal. Biochem., 156, 96 (1986)*	01125-25 01125-100	25 g 100 g
Silver Protein for Histology, Strong (not certified) [9015-51-4] *H4g* . . . . . Histological stain for microscopic analysis. *Thiery, (1967)*	25108-5 25108-25 25108-100	5 g 25 g 100 g
Tartrazine, 0.2% Aqueous Solution *H3g* . . . . . Counterstain for Mucicarmine and *H. Pylori* staining procedures. Cytoplasm stains yellow.	25100-500	500 ml
Terry's Polychrome Methylene Blue 2% Aqueous *A2g* . . . . . A STAT staining method for unfixed and fixed tissue. Stains nuclei more strongly than cell cytoplasm. Excellent dye for nuclear and nucleolar details. Can be used to demonstrate erythrocyte alterations/ inclusions and some erythrocyte parasites, as well as to visualize reticulocytes. Methylene blue is different from that in Romanowsky stains. In order to stain a slide with methylene blue a drop of stain is placed on a coverslip. The coverslip is then placed on an unfixed blood smear. An alternative method is to mix some stain with fresh blood before a blood smear is made. *J. Lab. Clin. Med., 8, 3 (1922)*	09978-470	470 ml
Verhoeff Van Gieson Elastin Stain Kit . . . . . This stain is useful in demonstrating atrophy of elastic tissue in cases of emphysema, thinning and loss of elastic fibers in arteriosclerosis and other vascular diseases. With increasing age, changes such as splitting and fragmentation occur, these changes are most obvious in the skin which becomes wrinkled and rather loose-fitting.	25089-1	1 kit
Villanueva Osteochrome Bone Stain *CH6g* . . . . . Useful for staining fresh, fixed, unembedded or plastic-embedded sections of bone. Villanueva Osteochrome Bone Stain gives uniform and reproducible results. Useful in studying biopsy or postmortem tissue. Technical Data Sheet #273 *Stain Technol., 49, 1 (1974); J. Histotechnol., 1, 19 (1977); 2, 23 (1979)* Human degenerative joint disease, stained with Villanueva Osteochrome Bone Stain, 20X.	16280-450	450 ml

Histology

	Catalog #	Size
Von Kossa Method for Calcium Kit	24633-1	1 kit

Demonstrates only calcium phosphate and calcium carbonate salts. Note that when used in skin specimens that the silver will reduce the melanin in the skin, to also give a black deposit. Used as a bone stain to indicate osteomalacia, or in other paraffin embedded tissues to stain calcium deposits seen in metabolic diseases, Paget's disease, renal osteodystrophy and hyperparathyroidism, necrotic areas associated with tubuculoses (TB), infarction (Gandy Gamna bodies), atheroma in blood vessels and Malakoplakia in the bladder (Michaelis-Gutman bodies). Technical Data Sheet #726



Calcified Necrotic kidney section, 4 microns, stained with Von Kossa Method for Calcium Stain Kit.

Kit Contains:

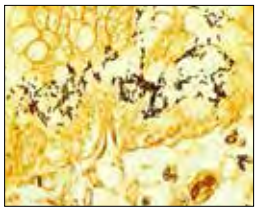
- 3% Silver Nitrate
- 5% Sodium Thiosulfate
- Nuclear Fast Red

Weigert's Hematoxylin Kit (Solution A & B)	25373-1	250 ml

A nuclear staining solution containing, hematoxylin, ferric chloride and hydrochloric acid used in many non-routine techniques (special stains) because, it resists decolorization in acidic staining solutions. Ferric Chloride is a strong oxidizer, so it serves both as a mordant and oxidizer for Weigert's Hematoxylin.

Warthin-Starry Stain Kit	25093-250	250 ml
	25093-500	500 ml

Identifies Spirochetes and other bacteria such as *H. pylori* and two causative agents of cat scratch disease, *Bartonella henselae* and *Afipia felis*. Warthin-Starry Stain relies on the ability of certain bacteria to bind silver ions from solution. Subsequent addition of a reducing agent then converts this bound silver to visible metallic silver. In the Warthin-Starry stain, tissue is sensitized prior to application of the silver complex. An aqueous silver nitrate solution combined with the reducing agent hydroquinone is applied and a silver diamine complex is generated. Technical Data Sheet #910



Kit Contains:

- 1.5ml – 2% Silver Nitrate
- 3.75ml – 5% Gelatin
- 2ml – 0.15% Hydroquinone Soln.

Certified Dyes

Acid Fuchsin, C.I. 42685, certified [989-38-8]	24991-25	25 g
	24991-100	100 g

MW 585.24 $C_{20}H_{17}N_3Na_2O_9S_3$

Used in the Masson's Trichrome Staining technique. This method is commonly used to stain tissue sections in the Histology and Cytology Laboratory in order to distinguish muscle from collagen. The muscle stains red with the acid fuchsin and the collagen is stained green or blue with light green SF yellowish or methyl blue. Also available ready-to-use, see page #48 *(Cat. #24602)*

Jocelyn H. Bruce-Gregorios, M.D.: Histopathologic Techniques, JMC Press Inc., Quezon City, Philippines, 1974.

Acridine Yellow G, C.I. 46025 [135-49-9] *HU4g*	22279-10	10 g

Fluorochrome used in insect histology and Schiff's reagent for periodate-positive fungi.

Conn's Biological Stains, 9th Ed., 1977; p358

Alcian Blue 8GX, C.I. 74240 [33864-99-2]	19175-10	10 g

Used primarily for demonstrating acid mucopolysaccarides with Scott's method and Mowry's staining methods. Used in electrophoresis for detecting glycoproteins. Also available in ready-to-use, see page 48 *(Cat. #25086)*

Histology

	Catalog #	Size
Aniline Blue, C.I. 42755, certified, water-soluble [28631-66-5] *U5g* . . . . . (Acid blue 22) MW 739.7 Used as contrast stain in histology and cytology and as a pH indicator (pH 10.0-13.0). Used with acid fuchsin as Mallory's connective tissue stain. Also used to visualize chromosomes and cellulose wall implants. *J. Histochem. Cytochem., 31, 823 (1983)*	02570-25	25 g
Azure A, C.I. 52005, certified [531-53-3] . . . . . MW 291.8 $C_{14}H_{14}ClN_3S$ Certified for use in Lillie's modified Nocht's method for paraffin sections and the NCCLS method for blood smears. *IR-Spectra (3), 1486:G / RegBook 1 (2), 2815:E / Stains and Dyes Ref, 109 / Structure Index 1, 447:B:6, Penny, DP et al, Analysis and testing of biological stains – The Biological Stain Commission Procedures Biotech. Histochem. 77(5&6), 237-275, (2002)*	24992-25 24992-50	25 g 50 g
Biebrich Scarlet, C.I. 26905 [4196-99-0] *U4g* . . . . . (Acid red 66; Ponceau B) MW 556.49 $C_{22}H_{14}N_4Na_2O_7S_2$ Widely used as a counterstain, as well as a useful plasma stain. λ max 505nm	03336-100	100 g
Brilliant Cresyl Blue, C.I. 51010, certified [81029-05-2] . . . . . (Brilliant Blue C, Brilliant Cresyl Blue) MW 385.96 $C_{17}H_{20}N_3OCl \cdot 1/2\ ZnCl_2$ Used as a supravital stain for reticulocytes. *Penny, DP et al, Analysis and testing of biological stains – The Biological Stain Commission Procedures Biotech. Histochem. 77(5&6), 237-275, (2002)*	24993-25 24993-50	25 g 50 g
Brilliant Green, C.I. 42040, certified . . . . . (Malachite Green G, Basic Green 1, Emerald Green) MW 482.63 $C_{27}H_{34}N_2NO_4S$ Used as a bacteriostatic agent for the selective enrichment and enumeration of *E. coli* and other fecal coliform organisms in water, milk and food. *Penny, DP et al, Analysis and testing of biological stains – The Biological Stain Commission Procedures Biotech. Histochem. 77(5&6), 237-275, (2002)*	24994-25 24994-50	25 g 50 g
Carmine, C.I. 75470, certified [1390-65-4] *U5g* . . . . . (Natural red 4; Cochineal) Used in microscopy for making various stains including stains for glycogen, mucin, nuclei and chromosomes. *Clark, G., Staining Procedures, 4th ed., Williams and Wilkins, 1981; p 111, 195, 212, 342*	02729-25	25 g
Chlorazole Black E, C.I. 30235, certified [1937-37-7] *M6g* . . . . . MW 781.7 A valuable stain in general histology and cytology. Gives sharp, clear-cut pictures of both nuclei and cytoplasmic structures. Also useful for differentiation of fungi. *Nature, 139, 549 (1937); Stain Technol., 39, 81 (1964)*	02730-25	25 g
Congo Red, C.I. 22120, certified (Direct Red 28) [573-58-0] *U4g* . . . . . (Direct red 28) MW 696.67 Anionic metachromatic dye. Good contrast stain or counterstain. Specific stain for amyloids in pathology. Also, a pH indicator; transition interval: pH 3.0 (blue) to 5.0 (red). Also available in ready-to-use, see page 48 *(Cat. #24614)* λ max: 497nm *Histochem. Cytochem, 10, 355 (1962)*	02736-25	25 g
Cresyl Violet Acetate, certified [10510-54-0] *U5g* . . . . . (9-Amino-5-imino-5H-benzo[a]phenoxazine acetate salt) MW 321.34 mp 140-143° Useful for staining Nissl substances in nerve cells and for bulk staining of nerve tissue.	21063-10	10 g
Crystal Violet C.I. 42555, certified [548-62-9] *BHM6ag* . . . . . MW 407.99 Crystal violet is used as a differential gram stain. *Also available in ready-to-use, see page 131 (Cat. #24686)*	00022-25 00022-100	25 g 100 g
Eosin Y, C.I. 45380, certified [17372-87-1] *U5g* . . . . . (Eosin yellowish; Acid red 87; 2′,4′,5′,7′-Tetrabromo-fluorescein, disodium salt) MW 691.9 Cytoplasmic counterstain. Component of Wright stain and MacNeal's Tetrachrome stain. Also available in ready-to-use, see pages 46 *(Cat. #09859 & 17269)*	02740-50	50 g

Histology

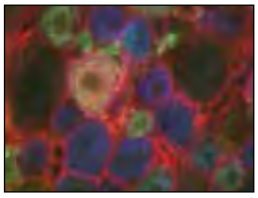
	Catalog #	Size
Fast Green FCF, C.I. 42053, certified [2353-45-9] *A2g*	02745-25	25 g
	02745-100	100 g

(Food green 3) MW 808.85 mp 290° (dec.)
Sensitive stain for proteins in polyacrylamide gels. Especially suitable in isoelectric focusing. Also suitable for use as a cytological counterstain, and mammalian tissue stain for muscle and collagen. λ max: 622-626nm
Anal. Biochem., 96, 263 (1979); 104, 494 (1980); Clark, G., Staining Procedures, 4th ed., Williams and Wilkins 1981; p114, 120, 125,197, 262, 301, 319, 324, 336, 355, 368, 415

Breast tissue, no nuclear staining, stains support structures.

Fluorescein isothiocyanate, certified, FITC [3326-32-7] *HPRS5e* — 00373-1 — 1 g

(Fluorescein 5-isothiocyanate; FITC) MW 389.4 mp >360°
Moisture sensitive isomer I, 90% minimum, laser grade. Reagent widely used for fluorescent labeling of proteins. Also used in the fluorescent antibody technique for identification of pathogens. Used in Fluorescent In-situ Hybridization (FISH) procedures.
Am. J. Pathol., 34, 1081 (1958); Methods in Enzymology, 26, 28 (1972); Anal. Biochem., 57, 227 (1974)


Rat dorsal ganglion, triple-labeled with FITC (CGRP) secondary antibodies, Texas Red® (extracellular matrix) and avidin-Pacific Blue (biotinylated isolectin GS-I-B4). Photo: Jeffrey C. Petruska, Dept. of Neuroscience, and Richard D. Johnson, PhD, Dept. of Physiological Science and Neuroscience, University of Florida Brain Institute.

Fuchsin, basic, certified, C.I. 42500 [569-61-9] *HM4g* — 06342-25 — 25 g

(Pararosaniline hydrochloride; Basic red 9) MW 323.83
For staining bacilli in tissue. Coupling agent for ultrastructural localization of esterases. λ max: 542 – 548 Technical Data Sheet #727
Stain Technol., 19, 45 (1944); J. Cell Biol., 29, 361 (1966)

Fuchsin, basic, certified, C.I. 42510 [632-99-5] *HM4g* — 00635-25 — 25 g

(Basic fuchsin; Basic violet 14; Rosaniline) MW 337.86
For staining glycoproteins and glycosaminoglycans in electrophoresis gels. More permanent bands are produced by post-staining with naphthol blue black. Tracking dye for proteins in acidic gel systems. Certified for use in staining bacterial flagella. λ max: 545 – 550nm
Anal. Biochem., 51, 152; 56, 361 (1973)

Giemsa Stain Powder, certified [51811-82-6] — 24998-25 — 25 g

MW 291.80 $C_{14}H_{14}ClN_3S$
Giemsa stain is a classical blood film stain for peripheral blood smears and bone marrow specimens, used to visualize chromosomes, stains fungus histoplasma and identifies mast cells.
Also available in ready-to-use, see page 48 *(Cat. #24602)*

Hanker-Yates reagent *HVWX7d* — 08661-5 — 5 x 1 g

A specific, sensitive and non-carcinogenic chromogen for immunoperoxidase techniques. Contains p-phenylenediamine and pyrocatechol. Gives a blue reaction product.
Technical Data Sheet #204
Histochem. J., 9, 789 (1977); Am. J. Clin. Path., 75, 367 (1981)

Hematoxylin, C.I. 75290, certified (Natural black 1) [517-28-2] *A2g*

	02749-25	25 g
	02749-100	100 g

MW 302.3
Nuclear protein stain and glycogen stain. Also a general tissue stain for human, animal and VIR histology.
Stain Technol., 14, 47 (1930); 62, 181 (1987)

Light Green SF Yellowish, C.I. 42095, certified [5141-20-8] *A5g* — 02753-25 — 25 g

MW 792.85
Used as a dye and as a biological stain. Certified for use as a counterstain in cytology. An important contrast stain for plasma as a critical component of Papanicolaou (PAP) stains. Stains collagen fibers when substituted for aniline blue in Masson's trichrome.
Merck Index, 11, 5361; Stain Technol., 6, 13 (1931); 14, 1 (1939); J. Technol. Methods, 25, 1 (1945), Churchill Livingstone, Theory and Practice of Histo. Tech., Bancroft & Stevens, p 466

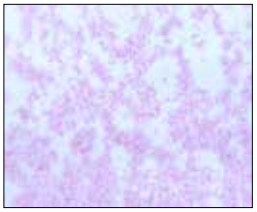
Histology

	Catalog #	Size
Malachite Green Oxalate, C.I. 42000, certified [2437-29-8] . . . . . MW 463.50 $C_{23}H_{25}N_2 \bullet C_2HO_4 \bullet 1/2\ C_2H_2O_4$ Malachite Green Oxalate is used as a counterstain for paraffin embedded botanical material and staining bacterial polysaccharides and spores. Also used as a contrast stain in the Ziehl-Neelsen procedure *Penny, DP et al, Analysis and testing of biological stains – The Biological Stain Commission Procedures. Biotech. Histochem. 77(5&6), 237-275, (2002)*	25002-25	25 g
Methyl Green, C.I. 42590, certified [7114-03-6] *U5g* . . . . . MW 472.5 mp 233° (dec.) Used with Pyronin Y to stain nuclei and nucleoli differentially. *Stain Technol, 26, 205 (1951); Mori & Lennert, Electron Microscopic Atlas of Lymph Node Cytology, Springer, 1969*	02760-25	25 g
Methylene Blue chloride, C.I. 52015, certified [61-73-4] *H5g* . . . . . MW 373.9 Sensitive stains for RNA, very good nuclear stain, used in many in vitro diagnostic applications. Also available in ready-to-use, see page 53 *(Cat. #09978)* Technical Data Sheet #727 *Clark, G., Staining Procedures, 4th ed., Williams and Wilkins: Baltimore, 1981*	04220-50	50 g
Neutral Red, C.I. 50040, certified [553-24-2] *adm* . . . . . (Basic red 5; 3-Amino-7-dimethylamino-2-methylphenazine hydrochloride; Toluylene red) MW 288.78 Used as an indicator. pH range 6.8 (red)-8.0 (yellow). Also used as a biological stain. λ max: 540nm Technical Data Sheet #PDS 890 and #PDS 892 *Merck Index 11, 6395*	00915-25	25 g
Oil Red O, C.I. 26125, certified [1320-06-5] *A2g* . . . . . (Solvent red 27; Sudan red 5B; Ceres red 5B) MW 408.5 mp 120° A post-electrophoresis stain for lipoproteins on cellulose acetate plates. Used to stain adipocytes in frozen sections. *Z. Clin. Chem. Clin. Biochem., 7, 540 (1969)*	06317-25 06317-100	25 g 100 g
Orange G, C.I. 16230, certified [1936-15-8] *U4g* . . . . . MW 452.38 Mallory's stain for collagen in connective tissue. Also useful as a stain for granules, elastic fibers, mast cells, and pollen tubes. General histology and cytology counterstain. Also available in ready-to-use, see page 118 *(Cat. #09782)* *Stain Technol., 13, 89 (1938); Am. J. Clin. Path., 20, 665 (1950)*	00968-100	100 g
Pyronin Y, C.I. 45005, certified [92-32-0] *U5g* . . . . . MW 302.8 Used in combination with methyl green for the selective and differential staining of nucleic acids. The pyronin Y stains RNA red, while the methyl green stains DNA green. The combined methyl green-pyronin Y stain is a useful histochemical reagent. Pyronin Y can also be used as a tracking dye for polyacrylamide gel electrophoresis. *Stain Technol., 27, 233 (1952); Clark, G., Staining Procedures, 4th ed., Williams and Wilkins 1981; p199*	18614-5 18614-25	5 g 25 g
Rose Bengal, C.I. 45440, certified [632-69-9] . . . . . MW 1017.64 $C_{20}H_2Cl_4I_4Na_2O_5$ Rose Bengal can be used as an alternative to phloxine B in Kreyberg's stain for keratin and mucus. Useful for detecting bacteria in soil. *Merck 13, 8343, Beilstein 19, IV, 2926*	25005-25	25 g

Histology

	Catalog #	Size
Safranin O, C.I. 50240, certified [477-73-6] *H5g*	02782-25	25 g

(Basic red 2; 3,7-Diamino-2,8-dimethyl-5-phenylphenazinium chloride)
MW 350.85
A general biological stain. Used as a nuclear stain for histological studies. Also used as a cationic lipophilic probe and in the detection of glycosaminoglycans and proteoglycans.
Eur. J. Biochem., 194, 389 (1990); Biochem. Int., 24, 485 (1991)



Francisella tularensis using a Safranin stain, Magnified 1000X. Image courtesy of CDC Public Health Library / Dr. P. B. Smith.

Sudan Black B, C.I. 26150, certified [4197-25-5]	25008-25	25 g

(Oil Red O, Sudan III, Sudan IV) MW 456.54 $C_{29}H_{24}N_6$
Useful for staining neutral triglycerides and lipids on frozen sections and some lipoproteins on paraffin sections. It has the appearance of a dark brown to black powder with maximum absorption at 596 – 605nm and melting point 120 – 124° C. It stains blue-black. Sudan Black B is one of the dyes used for Sudan staining. Similar dyes include Oil Red O, Sudan III, and Sudan IV.
J. Biochem. Biophys. Methods 21, 9, (1990) Abstract, Penny, DP et al, Analysis and testing of biological stains – The Biological Stain Commission Procedures. Biotech. Histochem. 77(5&6), 237-275, (2002), Merck 13, 8970

Tetrachrome Stain, certified (MacNeal's) *H4g*	02783-5	5 g

Blood stain similar to Wright's stain. Also useful for staining bone sections.
Conn's Biological Stains, Williams & Wilkins, 9th ed., 1977, p 606

Thionin, C.I. 52000, certified [78338-22-4] *U3g*	01220-10	10 g

(Lauth's violet) MW 287.34
A metachromatic, cationic thiazine dye that is used widely as a biological stain, especially in histology. Useful as a metachromatic stain for brain tissue and as a Nissl stain.
Stain Technol., 25, 195 (1950); 49, 49 (1974)

Toluidine Blue O, C.I. 52040, certified [92-31-9] *U5g*	01234-25	25 g

MW 305.83
A metachromatic, cationic thiazine dye that is widely used in in vitro biological applications. Also used in techniques for DNAase detection. λ max: 626nm
Stain Technol., 18, 35 (1943); 38, 281 (1963); J. Clin. Microbiol., 21, 195 (1985); Arch. Surg., 95, 16 (1967)

Toluidine Blue O, C.I. 52040, purified [92-31-9] *U5g*	15931-10	10 g

MW 305.83
Useful for staining RNA, oligodeoxynucleotides, proteins and glycosaminoglycans, skin lesion for Mohs. λ max: 626nm
Nature, 213, 1133 (1967); Anal. Biochem., 46, 156 (1972)

Trypan Blue, C.I. 23850 [72-57-1] *HVWX6g*	01294-100	100 g

(Direct blue 14; Niagara blue 3B) MW 960.83 mp >300°
Trypan blue has been widely used to assess the viability of eukaryotic cells. This method is often called trypan blue exclusion. Nonviable cells will exhibit a marked concentration of this blue dye in their nuclei. Tissue culture labs will find it extremely useful for determining the health and density of cell lines. Other studies have demonstrated trypan blue as an inactivating agent for measles and herpes simplex viruses and as a teratogenic agent in rats. λ max: 607nm
J. Histochem. Cytochem., 18, 581 (1970); J. Gen. Virol., 64, 1365 (1983); Teratology, 26, 289 (1982)

Wright Stain, certified [68988-92-1] *U4g*	02785-25	25 g
	02785-100	100 g

Useful for staining blood films and malarial parasites in blood films.
Also available in ready-to-use, see page 125 *(Cat. #24986)*

Dark stained bipolar ends of Yersinia pestis can clearly be seen in this Wright's stain of blood from a plague victim. Image courtesy of the CDC Public Health Library.

Histology

Dyes

	Catalog #	Size
Coomassie® Blue G250, C.I. 42655 [6104-58-1] *H2g* . . . . . (Brilliant blue G250; Acid blue 90) MW 854.03 Protein stain for SDS gels. Used in dye binding techniques for protein quantification. Also available in ready-to-use, see page 51 *(Cat. #24609)* *Anal. Biochem., 177, 100 (1989)*	03707-10 03707-50 03707-100	10 g 50 g 100 g
Coomassie® Blue R250, C.I. 42660 [6104-59-2] *H3g* . . . . . (Brilliant blue R250; Acid blue 83) MW 825.98 Rapid acting and sensitive dye for SDS gels. Also available in ready-to-use, see page 52 *(Cat. #24608)* *Electrophoresis, 8, 545 (1987)*	00352-10 00352-50 00352-100	10 g 50 g 100 g
Cuprolinic blue (Quinolinic phthalocyanine) [41276-95-3] *U7ad* . . . . . MW 1,084.54 Intensely blue cationic dye used for the visualization of RNA and other polynucleotides. Stain (microwave) used for enteric neurons. Can also used as a counterstain in immunoperoxidase procedures. *Histochem. J., 15, 801 (1983); 15, 1113 (1983); Biotechniques, 7, 692 (1989)*	17052-100 17052-500	100 mg 500 mg
1,9-dimethyl methylene blue zinc chloride double salt [931418-92-7] *H2g* . . . . . (Taylor's blue; 3,7'-Bis(dimethylamino)-1,9-dimethyldiphenothiazin-5-ium chloride) MW 416.05 g/mol mp 250° (dec.) Used in dye binding assays for glycosaminoglycans. *Anal. Biochem., 170, 293 (1988)*	03610-1	1 g
Direct Red 81, C.I. 28160 [2610-11-9] *A2g* . . . . . (Sirus Red) MW 675.61 mp 240° Contrast stain substitute for eosin Y with hematoxylin. *Clark, G., Staining Procedures, 4th ed., Williams and Wilkins, 1981*	16799-25	25 g
Gallamine Blue, C.I. 51045 [1563-02-6] *U5g* . . . . . (Mordant blue 45) MW 335.73 Used as a nuclear stain. Also used for detecting calcium in tissues. *Stain Technol., 3, 28 (1928); J.R. Microsc. Soc., 69, 20 (1944)*	05587-1	1 g
Gentian Violet, C.I. 42555, USP . . . . . MW 407.98 $C_{25}H_{30}N_3Cl$ Gentian Violet is the primary agent used in staining bacteria by the Gram Stain method.	24999-25	25 g
Hematein, C.I. 75290 (Hydroxybrasilein) [475-25-2] *U4g* . . . . . MW 300.26 mp 200° An indicator like hematoxylin; for staining animal tissue, particularly cell nuclei. *Merck Index 11, 4553*	01005-25	25 g
Nuclear Fast Red, C.I. 60760 [6409-77-4] *HU5g* . . . . . (Calcium Red, Kernechtrot,Bordeaux R, C.I. 60760) MW 357.28 Nuclear fast red staining is a simple method of nuclear chromatin staining and is mainly used for high-contrast counterstaining for histological applications. Also available in ready-to-use, see pages 52 & 54 *(Cat. #24199 & 24633)* λ max: 518nm *Clin. Chim. Acta, 2, 567 (1957)*	09773-5	5 g
Phosphomolybdic acid hydrate, ACS grade [12026-57-2] *BG6d* . . . . . (12-Molybdophosphoric acid) MW 3939.45 Electron dense metal stain.	01021-25	25 g
Phosphotungstic Acid hydrate [12501-23-4] *B4g* . . . . . MW 2,880.2 Negative Stain, EN Bloc Stain. *Principles and Techniques of E. M., 3rd ed., CRC Press, p. 273-279*	23224-25	25 g

Histology

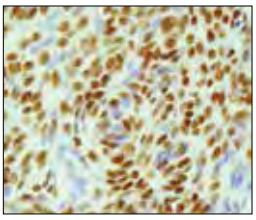
	Catalog #	Size
Rhodamine 6G, C.I. 45160 [989-38-8] (Basic Red 1) MW 479.01 $C_{28}H_{31}N_2O_3Cl$ Used as a tracer dye within water to determine the rate and direction of flow and transport. Rhodamine dyes fluoresce and thus can be detected easily, used extensively in fluorescence microscopy, flow cytometry, fluorescence correlation spectroscopy and ELISA.	25004-25 25004-50	25 g 50 g
Rosolic Acid, C.I. 43800 [603-45-2] (Paraosolic Acid, PSP, phenolsulfonphthalein, Aurin, Corallin, 4-[Bis(4-hydroxyphenyl)methylene]-2,5-cyclohexadienone) MW 290.31 $C_{19}H_{14}O_3$ Organic compound, forming yellowish or deep-red crystals with greenish metallic luster. Practically insoluble in water and freely soluble in alcohol. Soluble in strong acids to form a yellow solution or in aqueous alkalis to form carmine red solutions. Due to this behavior, it is suitable to be used as a pH indicator with pH transition range 5.0 – 6.8. λ max: 482nm *Merck 13, 885, Beilstein 8, IV, 2646*	25006-25	25 g
Sirius Red, C.I. 35780 [2610-10-8] *H4g* (Direct red 80) MW 1373.09 Cardiac muscle stain. Used to quantify Collagen I & III under polarized light. *Stain Technol., 62, 23 (1987); J. Histochem. Cytochem., 41, 465 (1993)*	09400-10 09400-25	10 g 25 g

Immunohistochemistry

Antigen Retrievals

L.A.B. Solution (Liberate Antibody Binding Solution) *H4g* — 24310-500 — 500 ml

L.A.B. Solution liberates your antibody binding sites for improved immunohistochemical (IHC) staining. Incubate your slides in L.A.B. Solution for 5 to 20 minutes at room temperature, rinse with buffer and stain. It's that simple, no high temperature or special equipment required. Incubating at room temperature makes L.A.B. Solution compatible with Automated Stainers. Set up a pre-treatment cycle with L.A.B. Solution before your staining protocol. Technical Data Sheet #630



Benefits:

- Ready to use solution, no dilution necessary
- Turn off the heat and preserve tissue - incubate samples at room temperature
- No special equipment required
- Compatible with Automated Stainers

pH Regulator for Antigen Retrieval, 1M NaOH — 25083-500 — 500 ml

Basic solution brings buffers back to appropriate pH levels.

Support Reagents

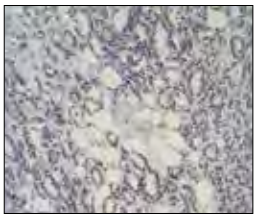
Bovine serum albumin (fraction V, protease-free), lyophilized *H4d* — 23854-10 — 10 g

MW ~66k

Blocking reagent. Lyophilized. *See pages 114 & 115 for other BSA products.*

HOPE® Fixation *A2d*

Achieve multiple applications including immunohistochemistry without antigen unmasking on paraffin embedded tissue. HOPE® H.E.P.E.S-glutamic acid buffer mediated Organic solvent Protection Effect. HOPE® is a combination of amino acids and glucose blended together with an organic buffer. Dehydration by acetone as the single dehydrating agent and pure paraffin denature proteins and preserve nucleic acids and antigenic-structures allowing clearly visible molecular level results. HOPE® is a two part system, both are required for application.
Technical Data Sheet #767



Detection of estrogen receptor in human breast carcinoma tissue via IHC without any antigen retrieval. Photo Courtesy of DCS – Innovative Diagnostik-Systeme.

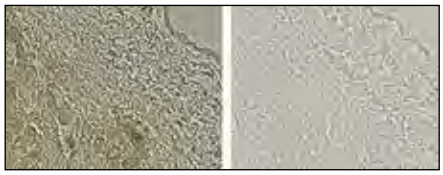
Kit Contains:

Histology

	Catalog #	Size
• 10 transportation vials of 5 ml HOPE® with protection vials • 1 x 1 ml, HOPE® II • 200 grams of low mp paraffin *HOPE® is a registered trade mark of DCS, Innovative Diagnostic Systeme, Germany. HOPE® is manufactured by DCS, Germany.*		
Fixative Starter Kit	24884-1	1 kit
System I	24823-500	500 ml
	24823-2500	2500 ml
System II	24824-1	1 ml

Melanin Bleach Kit *H4g* . . . . . 24883-1 1 kit

Remove melanin pigment in cells of malignant melanomas and reveal cellular detail! Accumulation of heavy melanin pigment in the cells of malignant melanoma can obscure cellular morphology and hinder special staining, IHC or histochemical staining. Melanins are pale brown to dark brown and even black pigments that are found intracellular in the cytoplasm. Melanins are found in hair, skin, retina and the substantia nigra of the brain. Removing melanin from tissue sections allows for positive staining to be interpreted correctly especially if DAB is used when performing immunohistochemistry. Our Melanin Bleaching Kit saves time, by removing melanin pigment prior to incubation with primary antibody.



Human skin sample before (left) and after (right) using Melanin Bleach Kit, magnified 40X.

Benefits:

- Reveals cellular morphology obscured by melanin pigment
- No mixing required
- Easy to visualize results

Delicate Melanin Bleach Kit for Special Stains and IHC *H4g* . . . . . 24909-1 1 kit

Delicate formula for removing melanin pigment in cells of malignant melanomas. Created specially for Special Stains and IHC.

Neuron specific enolase *A2d*

A unique form of the glycolytic enzyme enolase (E.C.4.2.1.11) found in neurons and in virtually all of the neuroendocrine, paraneuronal cell types. Certain neurological disorders are accompanied by increases in serum and spinal fluid NSE levels. NSE is also found in high concentrations in neuroendocrine tumors. Levels of NSE in biological fluids can be useful parameter for the assessment of neural tissue damage in the brain. Our human NSE and rat NSE have a specific activity of 40-60 units per mg. Both can be used in conjunction with anti-human NSE or anti-rat NSE to formulate an RIA to measure NSE levels in tissue, serum or spinal fluid. Technical Data Sheet #314

Human, lyophilized, purity >99%	17436-50	50 µg
Rat, lyophilized, purity >99%	17435A-50	50 µg

Peroxidase IHC Blocker, Ready-to-Use *A4d* . . . . . 24776-250 250 ml

Blocks Endogenous Peroxidase Activity. Many cells and tissues contain endogenous peroxidase and can increase your signal to noise ratio in immunohistochemistry staining. Peroxidase IHC Blocker, Ready-to-Use helps reduce non-specific background stain by treating sections prior to antigen retrieval. IHC staining patterns will be clean and more specific after treatment.

Poly(oxyethylene) sorbitan monolaurate (Tween 20®) [9005-64-5] *A2g* . . . . . 06110-100 100 g

MW 1,227.5 d 1.095 n^{20}_{D} 1.468 TSCA

Water-soluble surfactant. Technical Data Sheet #912

Histology

	Catalog #	Size
Prionex® *A2m*	24621-100	100 ml

Prionex® is a polypeptide fraction of highly purified dermal collagen of porcine origin with excellent protein stabilizing properties. Prionex® is prepared by partial hydrolysis under mild conditions. An extremely pure form of gelatine type A free from cartilage, bone and plasma components. Due to the chemical nature and the standardized quality, Prionex® can be used as an inert protein stabilizer in any kind of application and as an additive for cell culture media. No risk of BSE, MCD and HIV infective agents. Prionex® solution 10% is a clear yellow, sterile solution. pH 6.0-7.5

Gaffney PJ, Edgell TA, Dawson PA, Ford AW, Stocker K. A pig collagen peptide fraction. A unique material for maintaining biological activity during lyophilization and during storage in the liquid state. J Parm Pharmacol 1996; 48 896-8

Sodium Dodecyl Sulfate (SDS) Anionic Surfactant	BLI3945-10	10 g
	03945-100	100 g
	03945-1	1 kg

SDS is an anionic surfactant, which will decrease polymer bead hydrophobicity and can additionally participate in charge stabilization of the suspension. SDS is a more rigorous surfactant than is commonly used in uncoated polymer bead preparations.
Technical Data Sheet #912

Triton® X-100 *HV5g*	04605-250	250 g

A nonionic surfactant, Triton® X-100 is often used in the storage buffers of coated bead suspensions. Very low concentrations may be used in wash or binding buffers if needed (e.g. 0.0005%). Technical Data Sheet #912

Triton® X-100, 10% aqueous solution *HV5g*	18762-10	10 x 10 ml

Under nitrogen in sealed ampoules.

Antibodies

Anti-Albumin *H4d*
This polyclonal antibody reacts with all forms of bovine serum albumin and will cross-react with most mammalian albumins. This antibody efficiently precipitates protein and can be used in a variety of detection and capture techniques.

(bovine serum) in rabbit, IgG fraction	23715-5	5 mg
(human serum) in rabbit, IgG fraction	23716-5	5 mg

Anti-Aldolase (rabbit muscle) in goat, IgG fraction *H4d*	23719-5	5 mg

This Antibody reacts with aldolase from rabbit muscle showing a 161 kDa band under non-reducing conditions of SDS-PAGE and 40 kDa subunits when reduced. Antibody will cross-react with mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting

Anti-apoLipoprotein B in goat *A2dx*	23700-1	1 mg

Antibody will react with human type B apolipoprotein. Liquid form, concentration 1mg per ml. Requires Cold Pack

Anti-Avidin (egg white) in rabbit, IgG fraction, lyophilized *A2d*	23865-5	5 mg
Anti-Biotin in rabbit, IgG fraction, lyophilized *H4d*	23867-5	5 mg
Anti-Carboxypeptidase A (bovine pancreas) in rabbit, IgG fraction *A2d*	23731-5	5 mg

This Antibody reacts with carboxypeptidase A showing a 35 kDa band under reducing conditions of SDS-PAGE. Reactivity with other exopeptidases is not observed. This reagent is suited to enable an immunological approach to the study of protein and peptide structure. Suitable for: ELISA, Western Blotting

Histology

	Catalog #	Size
Anti-Deoxyribonuclease I (bovine pancreas) in rabbit, IgG fraction *H4d* . . . . . This Antibody reacts with deoxyribonuclease I from bovine pancreas. This enzyme has broad use in molecular biology. Cross-reactivity is expected against mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting	23732-5	5 mg
Anti-Elastase (porcine pancreas) in rabbit, IgG fraction *A2d* . . . . . This Antibody reacts with elastase from porcine pancreas showing a 26 kDa band under reducing conditions of SDS-PAGE. This reagent can be used to study connective tissue diseases and extracellular martix. Cross-reactivity will occur with mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting	23733-5	5 mg
Anti-Esterase (porcine liver) in rabbit, IgG fraction *A2d* . . . . . This Antibody reacts with esterase from porcine liver. Cross-reactivity is expected against most mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting	23734-5	5 mg
Anti-Fructose-6-phosphate kinase (rabbit muscle) in goat, IgG fraction *H4d* . . . . . This Antibody reacts with fructose-6-phosphate kinase from rabbit muscle. The high degree of sequence conservation of this glycolytic enzyme suggests that broad species and tissue reactivity will occur.	23735-5	5 mg
Anti-Glucose oxidase *(A. niger)* in rabbit, IgG fraction *A2d* . . . . . This Antibody reacts with glucose oxidase from *Aspergillus niger* showing a 160 kDa band under non-reducing conditions of SDS-PAGE and 80 kDA bands under reducing conditions. This reagent has been designed to facilitate the study of analytical glucose determinations. Suitable for: ELISA, Western Blotting, Immunoprecipitaion	23737-5	5 mg
Anti-Glutamate dehydrogenase (bovine liver) in rabbit, IgG fraction *H4d* . . . . . This Antibody reacts with glutamate dehydrogenase from bovine liver. Cross-reactivity is expected against most mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting	23738-5	5 mg
Anti-Goat IgG (H&L) in donkey *A2dx* (Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack		
Alkaline phosphatase conjugate	23769-1	1 mg
Rhodamine conjugate	23765-1	1 mg
Texas red conjugate	23766-1	1 mg
Anti-Human IgG (H&L) in goat *A2dx* (Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack		
Affinity purified	23770-2	2 mg
Alkaline phosphatase conjugate	23776-1	1 mg
	23783-1	1 mg
Biotin conjugate	23774-2	2 mg
	23781-1	1 mg
Fluorescein conjugate	23771-2	2 mg
	23778-1	1 mg
Peroxidase conjugate	23782-1	1 mg
Rhodamine conjugate	23772-2	2 mg
	23779-1	1 mg
Texas red conjugate	23773-2	2 mg
	23780-1	1 mg

Histology

	Catalog #	Size

Anti-Goat IgG (H&L) in rabbit *A2d*

(Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack

Affinity purified	23756-2	2 mg
Alkaline phosphatase conjugate	23762-1	1 mg
Biotin conjugate	23760-2	2 mg
Fluorescein conjugate	23757-2	2 mg
Rhodamine conjugate	23758-2	2 mg
Texas red conjugate	23759-2	2 mg

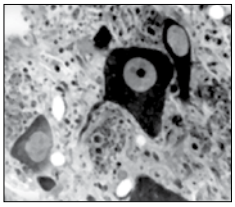
Anti-Human IgG (H&L) in sheep *H4d*

(Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack

Affinity purified	23784-2	2 mg
Alkaline phosphatase conjugate	23790-1	1 mg
Biotin conjugate	23788-2	2 mg
Fluoroscein conjugate	23785-2	2 mg
Rhodamine conjugate	23786-2	2 mg

Anti Neuron Specific Enolase (NSE) *A3d*

Both antisera are very specific and are the reagents of choice for the visualization of neurons and peptide secreting neuroendocrine cells by immunocytochemistry. The anti-human NSE can be used for immunocytochemical staining at dilutions of 1:3,000 to 1:5,000. The anti-rat NSE can be used at dilutions of 1:2,000 to 1:4,000. These antisera are also useful for the quantification of neurons and peptide secreting neuroendocrine cells by Radio Immuno Assay (RIA). The anti-human NSE and anti-rat NSE can be used in conjunction with pure human NSE *(Cat. #17436)* and pure rat NSE *(Cat. #17435A)* to formulate an RIA to measure NSE levels in tissue, serum or spinal fluid. Technical Data Sheet #266 and #314



Staining of rat cerebral cortical neurons with anti-rat NSE.

Brain Res., 181, 391 (1980); 190, 195 (1981); J. Neurochem., 36, 1093 (1981)

Anti-Human Neuron specific enolase (NSE) in rabbit, serum, lyophilized	17437-100	100 µl
	17437-200	200 µl
Anti-rat Neuron specific enolase (NSE) in rabbit, serum, lyophilized	16625-150	150 µl
	16625-350	350 µl

Anti-Lactate dehydrogenase (rabbit muscle) in goat, IgG fraction *H4d* . . . . . 23740-5 5 mg

Reacts with lactate dehydrogenase from rabbit muscle. All tetrameric isozymes of LDH react with this antibody. Cross-reactivity will occur against all mammalian forms of this enzyme.

Anti-Mouse IgG (H&L) in goat *A2dx*

(Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack

Alkaline phosphatase conjugate	23804-1	1 mg
Biotin conjugate	23795-2	2 mg
Peroxidase conjugate	23796-2	2 mg
	23803-1	1 mg

Histology

	Catalog #	Size
Anti-Mouse IgG (H&L) in sheep *H4d* (Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack		
Alkaline phosphatase conjugate	23811-1	1 mg
Biotin conjugate	23809-2	2 mg
Fluorescein conjugate	23806-2	2 mg
Peroxidase conjugate	23810-2	2 mg
Anti-Mutarotase (porcine kidney) in rabbit, IgG fraction *A2d* . . . . . . This Antibody reacts with mutarotase from pig kidney showing a 39 kDa band under non-reducing and reducing conditions of SDS-PAGE. Cross-reactivity will occur with most mammalian forms of this enzyme. Suitable for: ELISA, Western Blotting	23743-5	5 mg
Anti-Ovalbumin (egg white) in rabbit, IgG fraction *H4d* . . . . . . Reacts with ovalbumin from hen egg white showing a 45 kDa band under non-reducing and reducing conditions of SDS-PAGE.	23744-5	5 mg
Anti-Penicillinase (E.clocae) in rabbit, IgG fraction *A2d* . . . . . . This Antibody reacts with penicillinase from E.clocae. Cross-reactivity is expected against most bacterial forms of this enzyme. Suitable for: ELISA, Western Blotting	23746-5	5 mg
Anti-Pyruvate kinase (rabbit muscle) in goat, IgG fraction *H4d* . . . . . . Reacts with pyruvate kinase from rabbit muscle showing a 237 kDa band (tetramer) under non-reducing conditions of SDS-PAGE and a 57 kDa band under reducing conditions. Cross-reactivity will occur with most mammalian forms of this enzyme.	23750-5	5 mg
Anti-Rabbit IgG (H&L) in sheep *A2dx* (Secondary antibodies and conjugates, affinity purified) Enzyme conjugates of affinity purified antibodies are supplied with lot-specific recommended dilutions. Refer to website for more information. Requires Cold Pack		
Alkaline phosphatase conjugate	23818-1	1 mg
Biotin conjugate	23816-2	2 mg
Peroxidase conjugate	23817-2	2 mg
Texas red conjugate	23815-2	2 mg
Anti-Ribonuclease A (bovine pancreas) in rabbit, IgG fraction *A2d* . . . . . . This Antibody reacts with ribonuclease A showing a 14 kDa band under non-reducing and reducing conditions of SDS-PAGE. Antibody is designed for use in molecular biology. Cross-reactive with related RNAses. Suitable for: ELISA, Western Blotting, Immunoprecipitation	23751-5	5 mg
Anti-Transferrin (human) in rabbit, IgG fraction *H4d* . . . . . . Reacts with transferrin from human serum. Strong cross-reactivity will occur with mammalian forms of this protein. Suitable for: ELISA, Western Blotting, Immunoprecipitation.	23753-5	5 mg
Anti-Urease (jack bean) in rabbit, IgG fraction *A2d* . . . . . . This Antibody reacts with urease from jack bean showing a 480 kDa band under non-reducing conditions of SDS-PAGE. Enzyme can polymerize to a hexamer of 3 x 106 kDa. Cross-reactivity is expected against ureases of many bacteria, yeast and higher plants. Suitable for: ELISA, Western Blotting, Immunoprecipitaion	23754-5	5 mg

Histology

	Catalog #	Size
Citrate Buffer Kit, pH 6.0 (for antigen retrieval FFPE and resin) Formalin fixation forms protein cross-links that can mask the antigenic sites in tissue specimens, thereby creating weak or false negative staining for immunohistochemical detection of certain proteins. There are currently several antigen retrieval methods commonly used and the protocols below only intended as a general guide. Polysciences, Inc. provides AR buffer kits, that include rinses and pH adjustment reagents for the 20X concentration kit. These kits are recommended for formalin fixed paraffin embedded tissues.		
1X 10mM	25084-1	1 kit
20X 10mM	25079-1	1 kit
Mouse IgG, whole molecule, lyophilized *H4d*	23873-25	25 mg
Peroxidase-anti-peroxidase (rabbit), lyophilized *H4d* Sternberger's peroxidase-anti-peroxidase (PAP) immunocytochemical staining technique employs linkage of the visualizable enzyme horseradish peroxidase through unlabeled antibodies to a tissue antigen. Thus, any antigen for which you can prepare an antiserum can be visualized at the EM or light microscope level. The multiplication factor that is characteristic of enzyme reactions makes this one of the most sensitive assay techniques available. Technical Data Sheet #194A *L.A. Sternberger, "Immunocytochemistry," Prentice Hall (1983)*	06382-25	25 mg
Rabbit Anti-Green Fluorescent Protein Antibody *H4d* Green Fluorescent Protein (GFP) was originally discovered in *Aequorea victoria,* a luminescent jellyfish. GFP is useful for gene expression studies. Anti-GFP antibodies have been used for immuno-histochemical detection, purification via immunoprecipitation, protein-protein interaction studies, Western Blotting and ELISA-based assays. Polysciences' polyclonal Anti-GFP antibody can be used for detection and purification of GFP tagged proteins and reacts with a number of variants of *A.victoria* GFP. Specificity: Reacts with variants of *Aequorea victoria* GFP,such as S65T-GFP, RS-GFP, and EGFP. Technical Data Sheet #609	24240-0.1 24240-0.2	0.1 mg 0.2 mg
Rabbit IgG, whole molecule, lyophilized (Purified protein) *H4d*	23874-10	10 mg
Detection System & Counterstains		
Streptavidin Conjugates *H4d*		
AMCA conjugate, lyophilized	23864-1	1 mg
Peroxidase conjugate, lyophilized	23861-1	1 mg
Rhodamine conjugate, lyophilized	23862-1	1 mg
Unconjugated, lyophilized	23858-5	5 mg
Texas red conjugate, lyophilized	23863-1	1 mg
IHC Hematoxylin/Bluing Kit Formulated to impart light nuclear counterstaining desired with immunohistochemical chromogen staining. Controlled nuclear counterstaining will not over-stain and obscure nuclear IHC staining. Ready to use. Volume: 500ml for A and B. Kit Contains: • Counterstain • Bluing solution	25082-1	1 kit
SDS PAGE Electrophoresis		
Alcian Blue 8GX, C.I. 74240 [33864-99-2] Used primarily for demonstrating acid mucopolysaccarides with Scott's method and Mowry's staining methods. Used in electrophoresis for detecting glycoproteins. Also available in ready-to-use, see page 48 *(Cat. #25086)*	19175-10	10 g

Histology

Catalog #	Size

Coomassie® Blue G250, C.I. 42655 [6104-58-1] *H2g*

(Brilliant blue G250; Acid blue 90) MW 854.03

Protein stain for SDS gels. Used in dye binding techniques for protein quantification. Also available in ready-to-use, see page 51 *(Cat. #24609)*

Anal. Biochem., 177, 100 (1989)

Catalog #	Size
03707-10	10 g
03707-50	50 g
03707-100	100 g

Coomassie® Blue R250, C.I. 42660 [6104-59-2] *H3g*

(Brilliant blue R250; Acid blue 83) MW 825.98

Rapid acting and sensitive dye for SDS gels. Also available in ready-to-use, see page 52 *(Cat. #24608)*

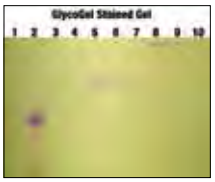
Electrophoresis, 8, 545 (1987)

Catalog #	Size
00352-10	10 g
00352-50	50 g
00352-100	100 g

GlycoGel Stain Kit *H4g*

Catalog #	Size
24693-1	1 kit

Glycoproteins are macromolecules composed of both a protein and carbohydrate portion. The sugar group can assist in protein folding or improved stability. Glycoproteins are often found in proteins that are located in extracellular spaces and are important in immune cell recognition such as: antibodies and Major Histocompatibility Complex (MHC). Glycoprotein detection in gel electrophoresis (PAGE) is performed by modified (PAS) Periodic Acid Schiff chemistry. This method is very selective and has a detection limit of approximately 25-100 nanograms/band.



Benefits:

- Detect glycoprotein on SDS-PAGE gels
- Glycoproteins are detected as magenta bands with a colorless background
- Ready-to-Use Kit stains 10 gels

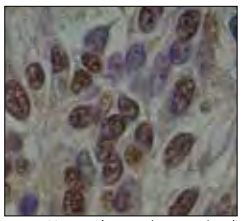
Dyes & Stains

DAB-4HCL, Immunochemical Grade [7411-49-6] *HMVW7bg*

(3-3'-Diaminobenzidine tetrahydrochloride) MW 360.1

Chromogen of choice for immunoperoxidase techniques. The brown reaction product is highly insoluble, and will not diffuse from the site of localization. The color does not fade, and therefore, slides can be saved as a permanent record. The reaction product also chelates with osmium tetroxide and becomes electron dense for use in electron microscopy. By adding buffer directly to the DAB serum vial with a hypodermic syringe, contact with the solid DAB is avoided. Our DAB-4HCl is prepared to the highest purity standards. It is fully water soluble and may be used without further purification for immunocytochemistry and for endogenous oxidases and peroxidase. Technical Data Sheet #164

Manual of Immunoperoxidase Techniques, 2nd Edition, ASCP Press, Chicago, 1987



Human breast tissue stained with DAB in Peel-A-Way® Micro-Cut Paraffin, 100X

Catalog #	Size
04001-2	2 x 25 mg 60 ml vials
04008-5	5 x 10 mg 30 ml vials
04001-5	5 x 25 mg 60 ml vials

Mounting Media

Adhesive, Tissue-Tack *H5gm*

For adhering tissue sections to slides during immunostaining and routine histology staining procedures. Technical Data Sheet #289

Stain Technol., 6, 358 (1982)

Catalog #	Size
16672-100	100 ml
16672-500	500 ml

Aqua-Poly/Mount *A2d*

Viscosity 390 cps n^{20}_{D} 1.454 – 1.460

Water-Soluble, Non-Fluorescing Mounting Medium. Formulated for mounting sections from aqueous solutions. Useful for immunofluorescent techniques as it enhances and retains fluorescent stains. Aqua-Poly/Mount can also be used for frozen sections, fat stains and immuno-stains when aqueous mounting media is required. Use Aqua-Poly/Mount with most fluorescent dyes and stains including DAB, Alkaline Phosphatase-Fast Red, AEC (aminoethylcarbozle) and a variety of other chromogens. Can be removed from slides by soaking in water. Supplied in convenient 20ml squeeze bottles. Technical Data Sheet #521

Catalog #	Size
18606-20	20 ml
18606-100	100 ml
18606-5	5 x 20 ml

Histology

	Catalog #	Size
Mowiol® 4-88 [9002-89-5] *U5g*	17951-500	500 g
	17951-1	1 kg

MW ~31,000 88% hydrolyzed

Mowiol® 4-88 is a high quality embedding medium for immunofluorescence and molecular biology applications. When hardened it has the same refractive index as immersion oil. If used for Immunofluorescence applications the addition of glycerin is recommended. Mowiol® 4-88 can be made an anti-fade medium through the addition of p-phenylenediamine. Technical Data Sheet #777

Cell, 18, 375 (1979); The Journal of Histochemistry and Cytochemistry, 41(12), 1833 (1993); Cytometry Part A, 52A, 90 (2003)

Poly-Mount® *CH5g*	08381-120	120 ml
	08381-940	940 ml

Viscosity 192 cps n^{20}_{D} 1.484

A crystal clear xylene based medium providing superior optical clarity and preserving most biological dyes with little or no fading when slides are stored in light tight containers. The viscosity permits bubble-free applications with minimal spreading and excellent adhesion of coverslips. Poly-Mount® is perfect for mounting and long term storage. It is non-water soluble, miscible with tolune and xylene. Technical Data Sheet #432

Poly-Mount Xylene *CH6g*	24176-120	120 ml
	24176-940	940 ml

Viscosity 107 cps n^{20}_{D} 1.48

Xylene based routine coverslipping medium for histology and cytology slides. This acrylic medium provides superior optical clarity. Poly-Mount Xylene is recommended for automated coverslipping instruments that use both glass and tape coverslips. It contains an anti-fade agent to prevent fading and yellowing with long term storage. Dries quickly for viewing, storage and filing. Technical Data Sheet #432

Equipment & Instruments

	Catalog #	Size
Upright Fluorescence Microscope	25039-1	1 unit

Microscope Features:

- EWF10X focusing eyepieces with eyeguards, 22mm field of view
- Siedentopf trinocular viewing head with photo tube; inclined 30º, rotatable 360º
- 48 – 75mm interpupillary distance settings
- AIS Infinity Corrected 10X, 20X, 40X,100X plan phase contrast and 20X and 40X Plan Fluor objectives
- 0/100 split to photoport or eyepieces
- Right hand controls, low position, scratch resistant mechanical stage, 185mm x 142mm, movement range 75mm x 55mm
- Turret phase condensor; N/A= 1.25
- Variable Koehler 6 volt 30 watt illumination
- FITC / GFP and DAPI with LP emission filter sets included

Inverted Fluorescence Microscope	25040-1	1 unit

Microscope Features:

- EWF10X focusing eyepieces with eyeguards, 22mm field of view
- Siedentopf trinocular viewing head with photo tube; inclined 30º, rotatable 360º
- 48 – 75mm interpupillary distance settings
- AIS Infinity Corrected 4X Plan (not phase) and 10X ,20X Plan phase and 20X and 40X Plan Fluor objectives
- 0/100 split to photoport or eyepieces
- Fixed plain stage 160mm x 250mm with glass insert and mechanical stage with lower right control
- ULWD condenser, N.A. 0.3, working distance 72mm
- Variable Koehler 6 volt 30 watt illumination
- FITC / GFP and DAPI with LP emission filter sets included

Light Source Features (Both Microscopes):

- 200w metal halide lamp with up to 1500 hour life
- Self aligning lamp is easy to replace
- Reduced heat transfer giving greater stability
- Higher ouput than traditional light sources
- Unsurpassed spectral output stability DC powered lamp
- 5 position manual light attenuator

Included Filter Sets (Both Microscopes):

- FITC / GFP Set – eGFP (FITC), Alexa Fluor® 488, Cy2®, DiO, Fluo-4
- DAPI with LP emission Set – DAPI, Hoechst 33342 & 33258, AMCA/AMCA-x, Cascade Blue, Spectrum Red

Microprobes and Picks Set of 4 stainless steel probes for use in inaccessible areas.	07397-1	1 set
New! PolyPress™ Tissue Embedding Tampers, small *A2g* Aids in the orientation of tissue samples during embedding. The handle height is ideal for use with or without the use of forceps. **Dimensions**: 10mm x 10mm	25960-1	1 each
New! PolyPress™ Tissue Embedding Tampers, large *A2g* Aids in the orientation of tissue samples during embedding. The handle height is ideal for use with or without the use of forceps. **Dimensions**: 15mm x 15mm	25964-1	1 each

Equipment & Instruments

	Catalog #	Size
New! PolyPress™ Tissue Embedding Tampers, combo *A2g* . . . . . Aids in the orientation of samples during embedding. The two sizes combined in one pack provide the necessary options when embedding various sized tissues. Pack includes one of each: • 10mm x 10mm • 15mm x 15mm	26013-2	2 pk

SHUR/Stain™ Manual Stainers

Choose between 3, 6 & 12 position configurations to meet your histology, cytology, dermatology, immunohistochemical, hematology, microbiology or special staining application needs. Individual lids are provided for use during extended inactivity. Clear plastic lid included for convenience & safety during periods of frequent use. Digital timer and 12 label strips included to record reagent expiration dates, lot numbers, etc.

3 Position = 6"d x 8"w x 7"h (160 x 203 x 178 mm)	25390-1	1 unit
6 Position = 6"d x 15"w x 6"h (160 x 375 x 156 mm)	25391-1	1 unit
12 Position = 6"d x 28"w x 6"h (160 x 718 x 156 mm)	25392-1	1 unit

SHUR/Trim™ Paraffin Block Dewaxer . . . . . 24980-1 — 1 each

Paraffin block trimming has never been easier or safer – eliminate cut hands and fingers. The SHUR/Trim™ Paraffin Block Dewaxer is an efficient laboratory tool for removing excess paraffin from embedding tissue cassettes. Simply slide paraffin blocks across the heated grooved surface. Melted paraffin is shaved away to disposable receptacle below. Preparing embedded tissue blocks for insertion into microtome quick release clamps has never been easier or safer. Dimensions: 6" W x 9" D x 7" H (15 x 23 x 18cm)
Weight: 5 lbs. (3kg) 115 VAC, 50/60 Hz, 4 Amps.

SHUR/Trim™ is a trademark of Triangle Biomedical Sciences, Inc. Durham, North Carolina, USA.

Stirrer, portable, for microfuge tubes, (Biovortexer) . . . . . 21747-1 — 1 unit

Hand-held, portable unit allows mixing of samples directly in centrifuge tubes or small vials. It is light weight, easy to use and battery powered. 100 disposable polypropylene stirring rods included.

Stirrers, Replacement for Biovortexer . . . . . 21748-1 — 1000 stirrers

Replacement stirrers for Biovortexer – 1/8" x 2".

Equipment & Instruments

	Catalog #	Size
Tissue Flotation Waterbath w/ 8" x 8" x 2 1/4" Deep Dish Make your tissue preparation easier, safer and more efficient. Removable glass dish waterbath with chemical resistant plastic housing, optimum specimen viewing provided a high contrast background illuminated by an LED light array. The dependability and safety of up to date microprocessor controlled electronics, combined with histo/orientor for flattening sections and a heated slide dryer in one compact unit. *See our Wrinkle Out Water Bath Solution (Cat. #25383) on page #44.*	25389-1	1 unit
New! Tissue Flotation Waterbath w/ 8" x 8" x 2 1/4" Deep Dish *A2g* Flotation waterbath work station, microprocessor controlled with removable glass dish. **Dimensions**: 8" x 8" x 2 1/4"	26012-1	1 unit
New! Tissue Flotation Waterbath w/ 8" x 11" x 2" Large Dish *A2g* Flotation waterbath work station, microprocessor controlled with removable glass dish. **Dimensions**: 8" x 11" x 2"	26010-1	1 unit
New! Tissue Flotation Waterbath w/ 8" x 11" x 2" Large Dish, HistoOrientor & Dryer *A2g* Flotation waterbath work station, microprocessor controlled with removable glass dish 8" x 11" x 2", slide dryer 2" x 8" and tissue orientor 2" x 2"	26011-1	1 unit
Scissors		
Gills A – Welsh Vannas Scissors, Straight, 11mm Blades Straight cutting edge. Useful for cutting NeuroVue® Dye Coated Filters for neuronal tract tracing studies.	24855-1	1 each
Scissors, Angled Stainless steel, angled tip.	07389-1	1 pair
Scissors, Iris Stainless steel Iris scissors, 4.5 inches.	07390-1	1 pair

Equipment & Instruments

	Catalog #	Size
Vannas Capsulotomy Scissors, Straight, 3mm Blades . . . . . Straight Cutting Edge, Vannas Microscissors.	24908-1	1 each
Vannas Capsulotomy Scissors, Straight, 7mm Blades . . . . . Vannas Capsulotomy Micro Scissors – 8cm long.	24856-1	1 each
Vannas Scissors, Straight, 5mm Blades . . . . . Straight Cutting Edge, Vannas Microscissors.	24839-1	1 each

Light & Electron Microscopy

Fixatives

Acrolein, distilled, 99% EM grade [107-02-8] *BCOPR6acg* . . . . . 00016-5 — 5 x 10 ml

MW 56.1 bp 52 – 53° 1000 ppm HQ n_D^{20} 1.4025 TSCA $H_2C{=}CHCHO$

Used in combination with other aldehydes such as formaldehyde or glutaraldehyde to fix very dense specimens since acrolein penetrates and reacts faster than other fixatives. Distilled and packaged in serum vials for easy handling. Requires Poison Pack

J. Histochem. Cytochem., 30, 1307 (1982)

Glutaraldehyde, EM Grade [111-30-8] *HOV6d*

Glutaraldehyde, EM Grade, 25%, is a homobifunctional linker that is suitable for binding amine-containing ligands to amine-modified beads. We supply EM (electron microscopy) grade glutaraldehyde in ampoules to ensure the highest activity. Each ampoule is fitted with an ampoule cracker for added safety. Technical Data Sheet #911

EM Grade, 8%	07710-100	100 ml
	07710-5	5 x 100 ml
EM Grade, 8% (10 x 10ml)	00216A-10	10 x 10 ml
EM Grade, 8% (30 x 10ml)	00216-30	30 x 10 ml
EM Grade, 25%	01909-100	100 ml
	01909-10	10 x 10 ml
	01909-5	5 x 100 ml
EM Grade, 50%	18428-100	100 ml
	18428-10	10 x 10 ml
	18428-5	5 x 100 ml
EM Grade, 70%	01201-2	10 x 2 ml
	01201-5	5 x 10 ml

Karnovsky's Fixative *BHMO6d* . . . . . 22872-5 — 5 kits

Formaldehyde/Glutaraldehyde fixative commonly used in EM for structural preservation. Pre-measured in ampoules for one-step preparation. Working solution can be stored for up to 6 months at 4° C. Technical Data Sheet #974

Kit Contains:

- 1 x 10ml 50% Glutaraldehyde
- 2 x 10ml 16% Formaldehyde
- 1 x 50ml 0.2M Phosphate Buffer

1. Karnovsky, M.J., A Formaldehyde-Glutaraldehyde Fixative of High Osmolarity for use Electron Microscopy. 1. Cell Biol. 27,137 A, 1965. 2. Hayat, M.A., Principles and Techniques of Electron Microscopy, Biological Applications, Third Edition, CRC Press, 1989.

Methanol (Methyl alcohol), 99.5% – EM Grade [67-56-1] *CH6g* . . . . . 08032-6 — 6 x 1 pint

Dehydrating agent of tissue as a preparation for embedment.

Light & Electron Microscopy

	Catalog #	Size
Osmium tetroxide, 2% solution *BH6g*	23310-10	10 x 2 ml
	23311-10	10 x 5 ml

Post fix and stain for E.M. Microfiltered solution in pre-scored sealed ampoules with each ampoule having its own ampoule cracker. Requires Poison Pack Technical Data Sheet #119A

Osmium tetroxide, 4% solution *BH6g*	0972A-20	20 x 2 ml
	0972B-5	5 x 10 ml
	0972C-20	20 x 10 ml

Post fix and stain for E.M. The solution is microfiltered and features exact concentration, no cross contamination, and has excellent stability when kept cold and in the dark. Supplied in pre-scored sealed ampoules with each ampoule having its own ampoule cracker. Used for post staining of DAB/peroxidase to darken and retain stain for long term storage. Requires Poison Pack Technical Data Sheet #119A

Manual of Immunoperoxidase Techniques, 2nd Ed., ASCP Press: Chicago, 1987; p58 Electron Microscopic Immunocytochemistry, Principles and Practice, Eds., Polak and Priestly, Oxford University Press, 1992; p91

Osmium tetroxide, crystalline, 99.95% [20816-12-0] *GPRS7g*	0223D-10	10 x 1/4 g
	0223A-5	5 x 1 g
	0223C-10	10 x 1/2 g
	0223B-10	10 x 1 g

MW 254.2 mp 39 – 41°

Post fix and stain for E.M. Supplied in pre-scored ampoules sealed in plastic bags. The ampoules are label free to avoid cleaning prior to preparation of solutions. Each ampoule is equipped with an ampoule cracker. Requires Poison Pack Technical Data Sheet #119A

Paraformaldehyde EM Grade [30525-89-4] *DH6g*	00380-250	250 g
	00380-1	1 kg

Paraformaldehyde depolymerizes in water to formaldehyde solution yielding consistent quality fixative solutions. To achieve a strong solution, raise the temperature of the water to 60° C then add sodium hydroxide solution dropwise.

Karnovsky, J. Cell Biology, 27, 137A (1965).

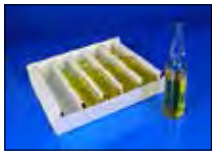
Poly/LEM Fixative *HM6g*	16864-3.75	3.75 L
	16864-4	4 x 3.75 L

For Light and Electron Microscopy. This popular methanol-free fixative is a formaldehyde-based material formulated to eliminate the need to select a fixative for tissue based on the type of microscopy to be employed. Technical Data Sheet #303

Ruthenium tetroxide, 0.5% stabilized aqueous solution [20427-56-9] *U5d*	18253-5	5 x 10 ml
	18253-10	10 x 10 ml
	18253-25	25 x 10 ml

Useful as a staining agent for electron microscopy of polymers, as well as a fixative for biological samples. Ruthenium tetroxide penetrates tissue very slowly, reacting strongly with proteins, glycogen and monosaccharides. Ruthenium tetroxide can be used as an even more aggressive form of staining for the study of polymers by TEM than osmium tetroxide. Supplied in pre-scored ampoules each with its own ampoule cracker. Store at 4° C in refrigerator. Technical Data Sheet #320

Hayat, M.A., Fixation for E.M., Academic Press, NY, 1981, page 194.



Trichloroacetic acid, 98% [76-03-9] *BK4d*	01241-250	250 g

Protein precipitant and fixative. Used in fixing solutions for PAGE and IEF gels.

Buffers

2,4,6-sym-Collidine Buffer Kit, EM Grade *HX7g*	00346-1	1 kit

(2,4,6-Trimethylpyridine Kit)

A biologically stable buffer system for osmium tetroxide and other EM fixatives. Provides better stability and buffering capacity than traditional veronal acetate buffers. One kit will make 1000 ml of buffer. Technical Data Sheet #111

Kit Contains:

- 5 x 5.34ml of Collidine
- 5 x 18ml of 1.0N HCl

Bennet, H.S. & Luft, J.H., J. Biophysics & Biochem. Cytol. 6, 113 (1959); Hendrickson, A., et al., Stain Tech., 43, 175 (1968)

Light & Electron Microscopy

	Catalog #	Size

Tissue Processing

Acetonitrile GR ACS, 99.5% [75-05-8] . . . . . .
MW 41.05 mp -48° C bp 81.63° C d 0.787 g/ml (15° C) C_2H_3N

Catalog #	Size
25670-450	450 ml
25670-1	1 L
25670-2.5	2.5 L
25670-4	4 x 4 L

Acetonitrile, Laboratory Reagent Grade, 99% [75-05-8] . . . . . .
MW 41.05 mp -48° C (lit.) bp 81 – 82° C (lit.) d 0.786 g/mL at 25° C (lit.) CH_3CN

Catalog #	Size
25671-100	100 ml
25671-1	1 L
25671-4	4 L

Hexamethyldisilazane (HMDS) [999-97-3] *BCH6g* . . . . . .
MW 161.4 bp 125° d 0.765 $C_6H_{19}NSi_2$
Used in place of critical point drying for preparation of soft tissues for SEM observation. Procedure takes 5 minutes as compared to 90 minutes for critical point drying.
Technical Data Sheet #342
Stain Technology, 58 (6), 347 (1983); Biotechnic and Histochemistry, 69 (4), 192 (1994)

00692-250 — 250 g

Propylene Oxide, EM Grade [75-56-9] *BCHV6g* . . . . . .
MW 58.08 bp 34° d 0.83 n^{20}_{D} 1.366 TSCA
Solvent used in the last stage of dehydration of tissue for epoxy embedding.
Requires Poison Pack

00236-1 — 1 pint

Uranyl Acetate 98%, ACS Reagent [6159-44-0] *HP6g* . . . . . .
MW 424.15
Uranyl acetate improves tissue penetration and contrast without affecting immunolabeling. Useful as positive or negative stain for thin sections.
EM J. Cell Biology, 101, 84a (1985)

Rat skeletal muscle. Stained with Uranyl acetate and lead citrate. Courtesy, Dr. J. Fulthorpe, Dept. Muscular Dystrophy Research, Newcastle General Hospital, UK.

21447-25 — 25 g

Resins & Catalysts

ERL-4221 [2386-87-0] *HO4g* . . . . . .
MW 252.3 g/mole bp (760 mm Hg) > 250° C $C_{14}H_{20}O_4$
Freezing Point: -35° C Specific Gravity: (20° C) ~ 1.17 ERL-4221 is a cycloaliphatic, diepoxy functional organic compound that is a useful building block in the production of semi-hard to hard cured epoxy resins. It is incompatible with amines, acids and strong bases and will cure to form a resinous product. ERL-4221 is often used in manufacture of plastic embedding kits for electron microscopy. Appearance: transparent, low color viscous liquid

24738-250 — 250 g

Nadic Methyl Anhydride (NMA) [25134-21-8] *adm* . . . . . .
MW 178.2 n^{25}_{D} 1.505
Liquid anhydride for curing epoxy resins. This material is a mixture of methyl isomers of methylbicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic anhydride. The larger the proportion of NMA used in the epoxy resin formula, the harder the resultant block. Technical Data Sheet #PDS 890 and #PDS 892

00886-450 — 450 g

Light & Electron Microscopy

	Catalog #	Size
Nonenyl Succinic Anhydride (NSA), EM Grade [28928-97-4] *H4g*	01542-450	450 g
	01542-4	4 x 450 g

Acid Number min. 470 MW 224 d 1.032 n^{20}_{D} 1.476 (lit
Curing agent for epoxy resins.
J. Biochem., 113, 573 (1993)

Catalysts

Benzil (Photopolymerization catalyst) *HU5g*	01946-25	25 g

MW 210.2 mp 95° TSCA $C_6H_5COCOC_6H_5$
UV polymerization catalyst. Technical Data Sheet #370

Benzoin ethyl ether [574-09-4] *HV7ag*	01359-50	50 g

MW 240.3 mp 60° TSCA $C_6H_5CH(OC_2H_5)COC_6H_5$
UV polymerization catalyst.

Benzoin iso-propyl ether [6652-28-4] *H5g*	00932-25	25 g

MW 254.3 mp 78° TSCA $C_6H_5CH[OCH(CH_3)_2]COC_6H_5$
UV polymerization catalyst.

Benzoin methyl ether [3524-62-7] *H6g*	00425-10	10 g

MW 226.3 mp 47 – 49° TSCA $C_6H_5CH(OCH_3)COC_6H_5$
UV polymerization catalyst.

Benzoyl peroxide, 70% active (water wet) [94-36-0] *FH4gp*	21446-100	100 g

MW 242.23 mp 105° TSCA $(C_6H_5CO)_2O_2$
Thermal polymerization catalyst.

Benzoyl Peroxide, Plasticized [94-36-0] *GH5g*	24232-100	100 g

MW 242.23 $(C_6H_5CO)_2O_2$
Thermal polymerization catalyst. Appearance: Dry powder

N,N-Benzyldimethylamine [103-83-3] *BEH6g*	00141-100	100 g
	00141-500	500 g

(BDMA; N,N-Dimethylbenzylamine) MW 135.21 mp 75° $C_6H_5CH_2N(CH_3)_2$
Low viscosity epoxy accelerator.

Glycol methacrylate

Immuno-Bed Kit *FGH06g*	17324-1	1 kit

Designed for use with immunohistochemistry (IHC) studies. The system allows adequate penetration of small molecular weight antibodies and chromogens, such as aminoethylcarbazole (AEC). Large molecular weight molecules may not stain well, even after etching the plastic from the section. Sections should be completed and stained as soon as possible after polymerization is complete, within 2 – 3 days. Immuno-Bed is a glycol methacrylate based embedding kit with performance similar to JB-4® and JB-4 Plus® in tissue infiltrations, embedding and cutting procedures. The embedded blocks are clear for excellent tissue visibility. Polymerization at 0 – 4° C is recommended to reduce the heat generated by the exothermic reaction. Technical Data Sheet #302

Kit Contains:

- 800ml Solution A, 30ml Solution B and 12g Benzoyl Peroxide Plasticized

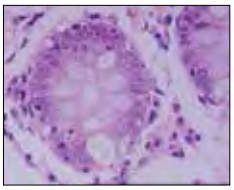
Additional Immuno-Bed Kit Components

Immuno-Bed Benzoyl Peroxide Plasticized (Catalyst) *FHG5g*	17325C-12	12 g
Immuno-Bed solution A *HO4g*	17325A-800	800 ml
Immuno-Bed Solution B *A2g*	17325B-30	12 ml

Light & Electron Microscopy

	Catalog #	Size
JB-4® Embedding Kit *HGO6g*	00226-1	1 kit

Water-soluble, GMA based, plastic resin kit intended for use in the preparation of embedded samples for high-resolution light microscopy. Widely used for research and clinical diagnosis. JB-4® yields semi-thin sections (0.5μ – 2μ) with excellent morphological preservation. Clear casts are obtained in 90 minutes or less at room temperature. JB-4® is the leading water-soluble plastic embedding kit for light microscopy. It has been successfully used in enzyme histochemistry and auto-radiography. Technical Data Sheet #123



Colon tissue embedded in JB-4®,stained with H&E, 40X, 2μm.

Kit Contains:

- 800ml Solution A, 30ml Solution B and 12g Catalyst

Am. J. Clin. Path., 73, 121 (1980); 76, 5 (1981); Stain Technol., 54, 5 (1979); J. Histochem., Cytochem., 31, 417 (1983); J. Histotech., 4, 59 (1981)

JB-4® Embedding Kit Replacement Bottles

Benzoyl Peroxide Plasticized (Catalyst) *GH5d*	02618-12	12 g
Solution A (Monomer) *HO5d*	0226A-800	800 ml
	0226A-3.8	3.8 liters
Solution B (Accelerator) *2d*	0226B-30	30 ml

JB-4® Mini Embedding Kit *GHO6d*	22507-1	1 kit

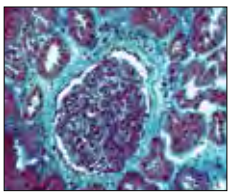
A pre-measured and ready-to-use version of the JB-4® Kit.
Technical Data Sheet #494

Kit Contains:

- 2 – 40ml Embedding Solution A, 2ml Embedding Solution B and 0.50g Benzoyl Peroxide Plasticized

JB-4 Plus® Embedding Kit *GH5d*	18570-1	1 kit

JB-4 Plus® offers all the benefits of JB-4®, plus some added features: cooler acting accelerator system for greater protection of tissue components; yields crystal clear non-yellowing blocks; the blocks resulting from JB-4 Plus® are ideal for processing dense material such as bone. GMA based plastic such as regular JB-4® cannot be removed from sections and is not recommended for IHC. Technical Data Sheet #393



JB-4 Plus® Section, Kidney glomerulus.

Kit Contains:

- 500ml Solution A, 15ml Solution B, 8g Benzoyl Peroxide and Catalyst

JB-4 Plus® Embedding Kit Replacement Bottles *HO4d*
Technical Data Sheet #393

Benzoyl Peroxide Plasticized (Catalyst) *GH5d*	18570C-8	8 g
Solution A (Monomer) *HO5d*	18570A-500	500 ml
Solution B (Accelerator) *2d*	18570B-15	15 ml

Light & Electron Microscopy

	Catalog #	Size

Methyl methacrylate

Methyl Methacrylate Embedding and Casting Kit *CHOV7m* . . . . . 23679-1 1 kit

Resin cures thermally (preferably under pressure) under anaerobic conditions and is capable of producing the highest quality hard, clear, colorless castings.

Kit Contains:

- 3 kg methyl methacrylate, 1 kg poly(methyl methacrylate) powder and 30 g catalyst

Methyl Methacrylate-Butyl Methacrylate Embedding Kit *HU7g* . . . . . 03573-1 1 kit

For electron microscopy. Can be used to embed tissue for thin or thick sectioning. By varying butyl methacrylate amount in embedding mix, block hardness is changed. Can be UV catalyzed. Technical Data Sheet #408

Kit Contains:

- 2 x 500g of methyl methacrylate, 1 x 500g of butyl methacrylate, 1 x 8g benzoyl peroxide, plasticized 70% & 1 x 10g benzoin methyl ether

Lowicryl Embedding Kits

Manufactured by Polysciences, these kits were developed in cooperation with the University of Basel, Switzerland. MonoStep™ K4M and MonoStep HM20 offer a convenient single bottle of material for Polar -35° C and Non-polar -70° C applications. Photopolymerization is by long wavelength (360nm) UV. Polymerization can take place at -70° C or at room temperature with UV light. Lowicryl gives enhanced preservation of protein molecules wand membrane structures. It is a methacrylate based, UV curing resin. All kits are useful for freeze-substituted samples. Resins should be used at maximum temperature of -20° C to minimize disruption of proteins. Lowicryl embedments have been reported to have rougher surfaces than epoxy embedments yielding more antigen at the section surface. Metal stains with Lowicryl are superior to uranyl and lead combinations. Technical Data Sheet #248

Lowicryl®HM 23 Non-polar, hydrophobic, -80° C Embedding Kit *CHIR7c* . . . . . 18162-1 1 kit

Kit Contains:

- 3 x 225 gm of monomer G, 1 x 40gm of crosslinker F, 1 x 3.7gm of initiator C and 1 x 5.5gm of initiator J

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl® K11M Polar Kit, hydrophilic, -60° C Embedding Kit *HIR7ag* . . . . . 18163-1 1 kit

Kit Contains:

- 3 x 250gm of monomer I, 1 x 40gm of crosslinker H and 1 x 4.3 gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl®HM 20 Non-polar, hydrophobic, -70° C Embedding Kit *HIR7ag* . . . . . 15924-1 1 kit

Kit Contains:

- 3 x 225gm of monomer E, 1 x 130gm of crosslinker D and 1 x 4.8gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Lowicryl®K4M Polar Kit, hydrophilic, -35° C Embedding Kit *HIR7ag* . . . . . 15923-1 1 kit

Kit Contains:

- 1 x 130gm of crosslinker A, 3 x 250gm of monomer B and 2 x 4.8gm of initiator C

J. EM Techniques, 11, 1099 (1989); 18, 172 (1991); J. Histochem. 40, (1), 123 (1992)

Light & Electron Microscopy

	Catalog #	Size
MonoStep™ Lowicryl® Embedding Media *CHO6d* Pre-mixed, ready to use Lowicyrl® MonoStep™ Embedding Media saves time and minimizes chemical contact. These products are ideal for use in Immunohistochemistry. They are based on our popular Lowicyrl® K4M and HM-20 formulations for low temperature embedding or freeze substitution. MonoStep™ products are especially appropriate for immunolableing resulting in better preservation of antigenicity and lower background labeling.		
HM-20 Non-polar	23994-225	225 g
K4-M Polar	23646-225	225 g

Poly/Bed

Poly/Bed® 812 Embedding Kit / BDMA (Glauert Version) *BHOV7m* . . . . . 21844-1 — 1 kit

This kit configuration provides even lower viscosity, and faster diffusion and penetration, than the standard Luft formulation. Technical Data Sheet #471

Kit Contains:

- 1 x 200ml Poly/Bed 812, 1 x 160ml Dodecenyl Succinic Anhydride (DDSA), 1 x 100ml Nadic Methyl Andydride (NMA) and 1 x 20ml BDMA (Benzyl dimethyl amine)

Poly/Bed® 812 Mini Kit/BDMA (Glauert Version) *BHOV7m* . . . . . 21959-1 — 1 kit

This kit configuration provides even lower viscosity, and faster diffusion and penetration, than the standard Luft formulation. Technical Data Sheet #472B

Kit Contains:

- 1 x 50ml Poly/Bed 812, 1 x 40ml DDSA, 1 x 25ml NMA and 1 x 5ml BDMA

Poly/Bed® 812 Embedding Media *H4g* . . . . . 08791-500 — 500 g

Viscosity100 – 200 cps TSCA

Epoxy resin for embedding. Cured by amine catalysts. Exact WPE number supplied on label, ranging from 140 – 160. Technical Data Sheet #233

Poly/Bed® 812 (Luft formulations) Embedding Kit / DMP-30 *BHOV7g* . . . . . 08792-1 — 1 kit

Technical Data Sheet #233

Kit Contains:

- 1x500gm Poly/Bed 812, 1x450g Dodecenyl succinic anhydride (DDSA), 1x450g Nadic Methyl anhydride (NMA) and 1x100g DMP-30

Poly/Bed® 812 (Luft formulations) Mini Kit *BHOV7g* . . . . . 21958-1 — 1 kit

Technical Data Sheet #472A

Kit Contains:

- 50ml Poly/Bed 812, 30ml DDSA, 20ml NMA, 5ml DMP-30 and Instructions included

Light & Electron Microscopy

	Catalog #	Size
Poly/Bed® Araldite 502 Mini Kit *EHJO7g* Technical Data Sheet #472C	21960-1	1 kit

Kit Contains:

- 1 x 30g Poly/Bed 812, 1 x 15g Araldite 502, 1 x 55g DDSA and 1 x 5ml DMP-30

Mollenhauer, Stain Tech., 39, 111 (1964)

Low Viscosity

Embed-It™ Low Viscosity Epoxy Kit [64-86-8]	24300-1	1 kit

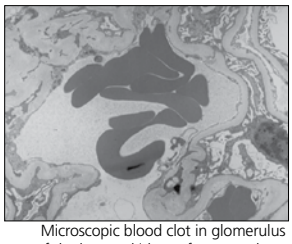
A modification of the Spurr's formulation, Embed-It™ Low Viscosity Epoxy Kit can be used for embedding biological, material and mineralogical samples. This kit is composed of two very low viscosity components (~65cps) packaged in easy to dispense squeeze top bottles. Components are mixed in equal parts by weight to make the infiltration and embedding resin. The resin readily penetrates into the specimen and cures to a clear hard solid overnight at 60° C. Technical Data Sheet #622

Benefits:

- Easy To Use – Mix Only 2 Components in Equal Proportions
- Save Time – Prepare the Embed-It™ Resin for Both Infiltration and Embedding
- Convenient – Mix Only the Amount You Need
- Less Hazardous – Components Ship Together As Non-Hazardous Materials

Spurr Low Viscosity Embedding Kit *HMV7g*	01916-1	1 kit

Exceptional penetration for tissue, mineral, and dense structures. A low viscosity of 60 cps allows easy penetration into a variety of difficult materials. May be used to prepare mineral specimens for polishing. The low viscosity of the Spurr formulation allows rapid infiltration into tissues, minerals and other dense structures. Facilitates embedments with high lipid contents or hard membranes or highly vacuolated *parenchymatous* tissues. Technical Data Sheet #127



Microscopic blood clot in glomerulus of the human kidney after transplant. Courtesy of P.Wills, Harris Medical Labs

Kit Contains:

- 450g NSA, 250g ERL 4221, 250g D.E.R. 736 and 100g DMAE

Spurr Low Viscosity Mini Kit *HMV7g*	21961-1	1 kit

Exceptional penetration for tissue, mineral, and dense structures. A low viscosity of 60 cps allows easy penetration into a variety of difficult materials. May be used to prepare mineral specimens for polishing. The low viscosity of the Spurr formulation allows rapid infiltration into tissues, minerals, and other dense structures. Facilitates embedments with high lipid contents or hard membranes or highly vacuolated *parenchymatous* tissues. Technical Data Sheet #127

Kit Contains:

- 55ml NSA, 20ml ERL-4221, 12ml DER736, 1ml DMAE and 3 x 10ml syringes, 1 x 5ml graduated syringe, 2 wooden mixers

Ultra Low Viscosity Embedding Kit *EHOV7g*	17706-1	1 kit

ERL-4221 is useful for rapid embedding of materials which are difficult to infiltrate even with Spurr's resin. Exhibits good sectioning qualities, beam stability, and staining properties. Miscible with alcohol or acetone so propylene oxide can be avoided. For EM and LM – **NOT water soluble**.

Kit Contains:

- 1 x 100g ERL-4221, 2 x 00g Octenyl Cuccinic Anhydride (DSA), 1 x 25g 1,4-Butanediol Diglycidyl Ether (BDE) and 1 x 100g Dimethylaminoethanol (DMAE).

Light & Electron Microscopy

	Catalog #	Size

Additional Resins

Araldite 502 Kit, Luft's Formula *EHJO7g* . . . . . 02600-1 1 kit

Araldite 502 kit, Luft's Formula overcomes penetration difficulties by using propylene oxide as an additional clearing agent. Permits embedding of tissue from fixation to sectioning in about 24 hours. Technical Data Sheet #128

Kit Contains:

- 500g Araldite 502, 450g DDSA, 100g DMP-30 and Instruction sheet

J. Biophys. Biochem. Cytol., 9, 409 (1961)

Araldite 502/PolyBed® 812 Kit *EHJO7g* . . . . . 02595-1 1 kit

Mollenhauer suggested that hardness variation and penetration enhancement could be obtained by mixing Araldite and Epon resins. We offer Araldite 502 and PolyBed® 812 for researchers to utilize Mollenhauer's findings. PolyBed® 812 is an exact chemical match for Epon 812. Both Araldite 502 and Polybed® 812 are useful as an embedding medium with acetone or alcohol dehydration. Technical Data Sheet #128

Kit Contains:

- 500g PolyBed 812, 500g Araldite 502, 450g DDSA, 100g DMP-30 and Instruction sheet

Stain Tech., 39, 111 (1963)

Balsam, Canada, filtered [8007-47-4] *C4bg* . . . . . 01648-100 100 g

01648-500 500 g

A natural resin used as mounting medium for microscopy.

Batson's #17 Anatomical Corrosion Kit *CFM7dw* . . . . . 07349-1 1 kit

Low viscosity, acrylic-based resin system for room temperature preparation of anatomical corrosion castings. After hardening, tissue is corroded away by caustic solution, yielding a durable, scientifically exact model for anatomical study. Technical Data Sheet #105

Kit Contains:

- 940ml monomer base, 2 x 100ml catalyst, 50ml promotor, 10g pigment red & 10g pigment blue

Fahrenbach, W.H., et al., J. Elec Microsc. Tech., 10, 15 (1988); Pollitt, C.C. & Molyneux, G.S., Equine Vet. J., 22(2), 79 (1990); Redmond H. P. et al., Brit. J. Surgery, 76(2), 198 (1989)

Additional Batson's #17 Anatomical Kit Components: *CFM7dw*
Technical Data Sheet #105

Blue pigment	07352-100	100 g
Catalyst	02608-100	100 ml
Green pigment	07353-100	100 g
Maceration solution	07359-940	940 ml
Monomer base solution	02599-940	940 ml
Promoter	02610-50	50 ml
Red pigment	07350-100	100 g
White pigment	07351-100	100 g
Yellow pigment	07354-100	100 g

Dibutyl phthalate [84-74-2] *H4g* . . . . . 00434-450 450 g

MW 278.4 bp 340° d 1.043 n_D^{20} 1.493 TSCA C_6H_4-1,2-$[CO_2(CH_2)_3CH_3]_2$

Plasticizer for polymers such as poly(vinyl chloride), poly(methyl methacrylate) and poly(vinyl acetate).

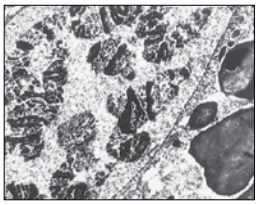
Light & Electron Microscopy

	Catalog #	Size
Dibutyltin dilaurate [77-58-7] *BH6g*	01862-50	50 g

MW 631.6 mp 24° bp 205° d 1.066 n^{20}_{D} 1.470 TSCA $[CH_3(CH_2)_{10}CO_2]_2Sn[(CH_2)_3CH_3]_2$
Catalyst for polymerizing lactide and glycolide and isocyanate reactions.
Appearance: Yellowish liquid

	Catalog #	Size
Diethylene glycol distearate (DGD) *A2g*	01873-500	500 g

MW 639.07
A removable embedding medium for thin and thick sections. In thicker sections the exterior surface of mitochondria can be observed whereas in resin-embedded thin sections the mitochondria are most frequently observed in a cross section. DGD (diethylene glycol distearate) is used to prepare tissue for immunofluorescent localization of cytoskeletal components. It is also used for tissue preparation for in situ hybridization with nucleic acid probes. Technical Data Sheet #426
Biochem. Cell Biol., 67, 242 (1989); Nature, 337, 454 (1989); J. Cell Biol., 98, 1978 (1984); 102, 1654 (1986)


Salivary Gland Cell from a Drosophila larva showing polytene chromosomes in the nucleus.

	Catalog #	Size
Dimethylaminoethanol (DMAE) [108-01-0] *BE6g*	01458-100	100 g

MW 89.14 bp 130° – 136° TSCA $HOCH_2CH_2N(CH_3)_2$
Curing agent for epoxy resins.

	Catalog #	Size
DMP-30 [90-72-2] *BH6g*	00553-100	100 g

MW 265.4 bp 316° Viscosity ~200 cps n^{20}_{D} 1.515 TSCA
$[(CH_3)_2NCH_2]_3C_6H_2OH$
Curing catalyst for epoxy resins. Appearance: light yellow to yellow liquid

	Catalog #	Size
Dodecenylsuccinic anhydride (DDSA) [19780-11-1] *H2g*	00563-450	450 g
	00563-4	4 x 450 g

MW 266.38 bp 181°/5mm d 1.005 Viscosity 440 cps n^{20}_{D} 1.479 TSCA
Epoxy hardener, suitable for use in embedding procedures.

Araldite resins (modified epoxy resins)
TSCA C_6H_4-1,2,-$[CO_2(CH_2)_3CH_3]_2$
Technical Data Sheet #128

	Catalog #	Size
Grade 502 WPE 233 – 250 [84-74-2] *HO5g*	00552-500	500 g
Grade 6005 WPE 182 – 189 [3101-60-8] *HO7g*	02116-500	500 g

	Catalog #	Size
Epon® Resin 828 [25068-38-6] *HO2g*	02334-500	500 g

(Bisphenol A diglycidyl ether) MW ~377 Viscosity 10,000 – 16,000 cps WPE: 185 – 192 TSCA
Standard epoxy resin used in formulation, fabrication and fusion technology. Widely used for embedding and potting. When cross-linked or hardened with appropriate amine curing agents, very good mechanical adhesive, dielectric and chemical resistance properties are obtained.

	Catalog #	Size
Epon® Resin 1001F [25036-25-3] *HO2g*	24305-500	500 g

(Bisphenol A diglycidyl ether) MW 1,075 Viscosity 7.0 – 9.6 cps @ 25% solid WPE: 525 – 550
Higher MW epoxy resin cured by amine catalyst and used for embedding. Appearance: White to pale yellow solid

	Catalog #	Size
Epoxy Resin Removal Kit	21487-1	1 kit

Quickly removes epoxy resin from thin sections in five minutes under mild conditions preserving delicate immunogenicity of specimens.
Technical Data Sheet #440

Kit Contains:

- 100ml of solution A and 3ml of solution B

Stain Tech. 65, 205 (1990); Mikroscopie, 42, 315 (1985)

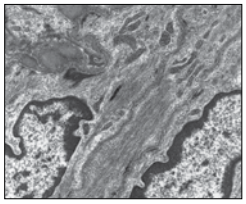
Light & Electron Microscopy

	Catalog #	Size
Ethylene glycol diglycidyl ether (Quetol 651) [2224-15-9] *H5g*	01479-100	100 g

MW 174.2 bp 112°/4.5mm n_D^{20} 1.463 TSCA
Crosslinker for carboxyl-, amine- and hydroxyl- functional polymers. Material is ~100% active and contains higher molecular weight compounds having chloropropylene segments produced by reaction with more than one epichlorhydrin molecule per hydroxyl in synthesis.
Histochemical Journal, 20, 222 (1988)

L.R. White Embedding Media *H2g* — 17411-500 — 500 g

L.R. White is the first low viscosity acrylic embedding medium product made by London Resin Company. Used for routine light and electron microscopy, histochemisty and immunohistochemistry, L.R. White can be cold or thermally cured. Accelerator for room temperature curing of the resin is available for those applications where simple heat catalysis is inappropriate. Requires Cold Pack Technical Data Sheet #305
A. Am. J. of Anatomy, 175, 267 (1986)



L.R. White® Embedded Hamster Intestine.

PEG 4000 Resin [25322-68-3] *A2g* — 16861-250 — 250 g

mp 53 – 56° C
This water soluble, nonionic material is used like paraffin to infiltrate and embed tissue. Easily removed from sections with 95% ethanol for immunocytochemical and x-ray microanalytical techniques.
Technical Data Sheet #279
J. Cell Biol., 95, 101a (1982); Biol. Cell, 44, 85 (1982)

Poly(ethylene glycol) (n) distearate [9005-08-7] *A2g*
Soluble in IPA, hot water, mineral oil. TSCA $CH_3(CH_2)_{16}CO(OCH_2CH_2)_nO_2C(CH_2)_{16}CH_3$
Waxy, water dispersible solid. n = value is MW of PEG unit.

MW 200	mp 32 – 36°	02298-100	100 g
		02298-500	500 g
MW 400	mp 35 – 37°	01048-100	100 g
		01048-500	500 g
MW 6,000	mp 52 – 57°	19234-100	100 g

Poly(ethylene glycol) (n) distearate, Flaked [9005-08-7] *A2g* — 25096-100 — 100 g

MW 6,000 mp 52 – 57° $CH_3(CH_2)_{16}CO(OCH_2CH_2)_nO_2C(CH_2)_{16}CH_3$ n = 6,000
A removable embedding medium for thin and thick sections. In thicker sections the exterior surface of mitochondria can be observed whereas in resin-embedded thin sections the mitochondria are most frequently observed in a cross section. Used to prepare tissue for immunofluorescent localization of cytoskeletal components. It is also used for tissue preparation for in situ hybridization with nucleic acid probes.
Biochem. Cell Biol., 67, 242 (1989); Nature, 337, 454 (1989); J. Cell Biol., 98, 1978 (1984); 102, 1654 (1986)

Quetol 651 Embedding Kit *HO7g* — 16908-1 — 1 kit

Fast penetrating epoxy embedding medium for EM and LM. Water miscible. Polymerized blocks section easier than in ordinary epoxy resin mixture and show excellent electron image contrast. Acts as a dehydrating agent. Technical Data Sheet #297

Kit Contains:

- 1 x 100ml Quetol 651
- 1 x 250g NSA
- 1 x 30ml DMP-30

Light & Electron Microscopy

	Catalog #	Size
Unicryl™ Resin *EMU6f*	22770-250	250 ml

A unique, largely hydrophilic, acrylic resin, developed for universal use in LM and EM applications. When fully polymerized, Unicryl demonstrates excellent cutting characteristics. Sectioning surface follows the contours of the tissue during cutting action, producing a highly exposed surface of proteins and nucleic acids for subsequent immunohistochemistry techniques. Resin preserves these structures without interacting or cross-linking with them. Provides optimum sectioning and staining for animal, plant and microbiological tissues for Light Microscopy and Electron Microscopy. Unicryl is provided as a ready-to-use single solution. No mixing required. Resin remains liquid to -30° C, Stable for one year at 4° C.

Pancreas, 1µm section
Polychromatic Stain

Ilford & Photographic Products

Ilford Emulsions *H2ad*

Ilford nuclear research emulsions are well known for their uniform particle size, low background, long time stability, and their consistent grain size. The useful life of the emulsion is determined by the ambient exposure it receives through cosmic radiation and local radioactivity and the amount of background that can be tolerated. Requires Cold Pack Technical Data Sheet #015

K2 – mean crystal diameter 0.20µm	02757-50	50 cc
	02757-100	100 cc
K5 – mean crystal diameter 0.20µm	02746-50	50 cc
	02746-100	100 cc
K5D – mean crystal diameter 0.20µm	17537-100	100 cc
L4 – mean crystal diameter 0.13µm	02747-50	50 cc
	02747-100	100 cc

Ilford Nuclear Emulsion Plates L-4 *H2ad*

Ilford Nuclear Emulsion Plates find wide application in medical and biological research using radioactive tracers, in mineralogical research, in subatomic nuclear physics and in specialized astronomical studies.

25µm,1" x 3"	7717PA-10	12 Plates
25µm, 3" x 3"	7717PC-12	12 Plates
50µm, 1" x 3"	7717PB-12	12 Plates

Ilford Rapid fixer *H4g* — 21953-500 — 500 ml

Fast acting, non-hardening ammonium thiosulfate fixer that assures complete fixing of all Ilford papers in as little as 30 seconds and can be used to fix film. Ideal for fiber base and resin coated papers. Useful for archival processing and is recommended for Ilford emulsions. Can be used in a 1:3 dilution.

Ilford Safelight Filters, Light Brown 902 — 16779-8 — 1 filter

For use with blue sensitive materials including Ilfobrom Multigrade III, Lifospeed EM film, and all of Ilford Nuclear Research Emulsions. Light brown filters should be used for general darkroom illumination approximately 2m or 5 feet from the work area. Dark brown filters should be used for direct illumination approximately 600mm or 2 feet from work area. 8" x 10"
Technical Data Sheet #271A

Ilford Universal Stop Bath *BH6g* — 21956-500 — 500 ml

This economical, highly active solution is designed to immediately terminate the action of both black and white films and paper. It prevents fog or stains while maintaining the conditions of the fixer. Recommended for use with Ilford emulsions and films and both resin coated and fiber based papers. Liquid is concentrated and normally used in a 1 to 9 dilution.

Kodak Electron Microscopy Film 4489, 6.5cm x 9cm — 00583-1 — 100 sheets

This fine-grain film designed for electron microscopy and electron diffraction with the TEM operating in the medium electron-energy range (25kV to 125kV). This film is approximately half the speed of Kodak Electron Image Plates and Electron Image film SO-163. It is recommended to use the Kodak Safelight Filter Kodak IA or OA. Dimensions: 6.5cm x 9cm (2.6" x 3.5")

Light & Electron Microscopy

	Catalog #	Size
Stabilizer for B & W Film Stabilization *H5g* . . . . . Ready-to-use pre-mixed solution formulated to prevent "browning" when stabilized prints are dried in a heated dryer. Temperature range: 68° – 72° C	07619-1	1 quart
Storage Envelopes, Photographic		
Unprinted glassine (holds 3.25" x 4.25" neg.)	19484-500	500 env.
Unprinted glassine (holds 4" x 5" neg.)	19485-500	500 env.
Unprinted polyethylene (holds 3.25" x 4.25" neg. or plates)	07233-500	500 env.
Unprinted polyethylene (holds 4" x 5" neg. or plates)	07235-500	500 env.

Molds

BEEM® Embedding Capsules, Size 00 . . . . . .
Polyethylene BEEM® capsules are the most commonly used embedding capsules for all types of resins. The embedding block requires little or no trimming. The closed capsules are UV transparent for polymerization of acrylics. In addition to the two standard 3 and 00 sizes, we have the conical and bottle-necked 00 sized designs for centrifuged material embedding. These capsules can withstand up to 600 G. Be sure to use our capsule holders and capsule press for convenient use of these versatile capsules. Use with JB-4®, Immuno-Bed (GMA), Osteo-Bed, Osteo-Bed Plus (MMA) and other resins that do not polymerize well in conventional silicone rubber molds.

00224-100	100 caps
00224-500	500 caps
00224-1000	1000 caps

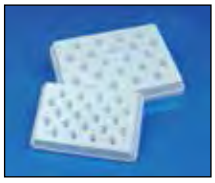
BEEM®, Flat, Transparent . . . . . .
Manufactured from transparent polyethylene. Useful for embedding media such as JB-4®, glycol methacrylate and other methacrylates which do not polymerize well in conventional silicone rubber molds. The transparency of the mold permits accurate specimen orientation when illuminated from below. The molds are flexible and reusable. Each mold is supplied in a protective plastic case. Dimensions: 2.54mm x 5.33mm x 12.32mm

23257-1 — 1 mold

BEEM® Embedding Capsules
Polyethylene BEEM® capsules are the most commonly used embedding capsules for all types of resins. The embedding block requires little or no trimming. The closed capsules are UV transparent for polymerization of acrylics. In addition to the two standard 3 and 00 sizes, we have the conical and bottle-necked 00 sized designs for centrifuged material embedding. These capsules can withstand up to 600 G. Be sure to use our capsule holders and capsule press for convenient use of these versatile capsules. Use with JB-4®, Immuno-Bed (GMA), Osteo-Bed, Osteo-Bed Plus (MMA) and other resins that do not polymerize well in conventional silicone rubber molds.

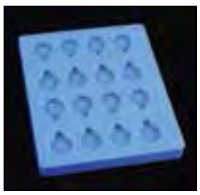
Size 00 bottle necked capsules	00295-100	100 caps
Size 00 conical capsules	00294-100	100 caps
Size 3 capsules	00336-100	100 caps

BEEM® Capsule Holders
For holding capsules upright during polymerization. Holds 22 capsules in numbered cavities. Made from an epoxy resistant material that embedding media will not stick to. Also suitable for gelatin capsules. Cavities may be illuminated from below to facilitate specimen orientation.



Size 00, regular (heat curing) for capsules	0256A-3	3 holders
	0256A-12	12 holders
Size 3, regular (heat curing) for capsules	0256B-3	3 holders
	0256B-12	12 holders

Light & Electron Microscopy

	Catalog #	Size
BEEM® Embedding Capsules, Block Storage Box Holds up to 10 polymerized size 00 blocks in numbered compartments. Contained in a protective hinged case to avoid dust contamination.	03604-10	10 boxes
Chien Embedding Molds, Universal Allows up to 16 tissue samples to be sectioned both on lateral and transverse planes without re-embedding. Can also be used as a general flat embedding mold. Casts made from this mold can be used on Leica/ Reichert, LKB and most EM Microtomes with flat embedment chucks. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit. 	19440-1	1 mold
Embedding Mold Trays For JB-4®, JB-4 Plus®, Immuno-Bed, L.R.-White®, L.R.-Gold® or Paraffin embedding. This is an embedding system of reusable molds and trays with colored stubs.		
12mm x 8mm molds	23184-1	100 molds
16mm x 8mm molds	23185-1	100 molds
19mm x 13mm molds	23186-1	100 molds
Embedding mold tray	23188-1	10 trays
4mm thin - white stubs	23189-1	100 stubs
10mm thick - mixed stubs	23197-1	100 stubs
Embedding Molds – Multispecimen, Flat – Opaque This mold contains 20 shaped cavities plus 8 oblong cavities 3.5mm wide in three different lengths. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit. Dimensions: 113mm x 17mm	23261-1	1 mold
Embedding Molds – Silicone, Flat, Numbered Cavities – Opaque Produced from opaque silicone rubber. Durable and flexible with 21 consecutively numbered shaped cavities. Molds have high thermal and chemical resistance. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit. Mold dimensions: 69mm x 90mm Cavity dimensions: 5mm x 12mm x 4mm	23258-1	1 mold
Embedding Molds – Silicone, Flat, Polysciences Flexible silicon rubber mold, releases up to 21 blocks by flexing. Reusable and can be used to store material prior to sectioning. Use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kit. Cavity dimensions: 5mm x 12mm x 4mm deep	02615-1	1 mold

Light & Electron Microscopy

	Catalog #	Size
Embedding Molds – Silicone, Round	23260-1	1 mold

For use with epoxy based resins, Araldite resins, Embed-It™, Spurr Low Viscosity Embedding Kit and Ultra Low Viscosity Embedding Kits for large or odd shaped specimens. Embedded blocks are 14mm in diameter. Up to six blocks per mold.

Gelatin Embedding Capsules

Economical and convenient method for producing resin blocks. UV transparent, ideal for UV Polymerization of acrylic resins. Can be used with most resins. Capsules have snap-shut lids which cannot slide off accidentally. Capsules are also useful for storing grids and TEM calibration specimens.

Gelatin, Size 00 (23.3mm long x 8.18mm wide; 0.95ml volume)	00225-1000	1000/pk
Gelatin, Size 1 (19.0mm long x 6.63mm wide; .50ml volume)	07347-1000	1000/pk
Gelatin, Size 4 (13.9mm long x 5.05mm wide; .21ml volume)	07348-1000	1000/pk

JB-4 Aluminum Chuck (11mm shaft, 10mm diameter)	15901-1	1 unit

Reusable aluminum chuck supplied complete with thumbscrew. Designed for use with our Plastic Block Holders *(Cat. #15899)* and molding trays. Compatible with: Hacker, A/O Reichert rotary and Autocut, JB-4 and JB-4A, LKB Ultratomes and Shandon Hypercut.

JB-4® Plastic Block Holders	15899-50	50 holders

Easy to store plastic block holders for resin. Matte surface for easy marking and a large center hole to prevent bubble formation. Block Holders fit securely onto molding cup tray cavities. Attach to Polysciences' reusable chucks designed for commonly used microtomes.

Micron Micromolds Embedding Capsules	08408-50	50 units

Self supporting unit of 10 size 00 conical end capsules in numbered positions for economical embedding. The Capsules are self supporting and do not require additional holders. The mold is made from polyethylene and gives pre-shaped blocks with 1mm square tips similar to BEEM® capsules. The blocks are easy to remove and require little or no final trimming. Use with JB-4®/JB-4®Plus, Osteo-Bed/Osteo-Bed Plus and other GMA or MMA resins.

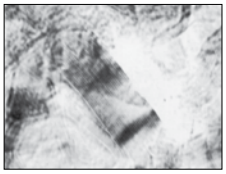
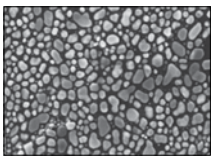
Polyethylene Molding Cup Trays

Light-weight, durable plastic trays, ideal for resin molding specimen blocks with JB-4® and other resins. Use in conjunction with Polysciences' popular and inexpensive block holders and chucks. Also use with Immuno-Bed, L.R. White, L.R. Gold, Micro-Cut and GemCut® paraffins.

6 x 12 x 5mm (20 cavities)	16643A-1	1 unit
12 x 16 x 5mm (20 cavities)	16643B-1	1 unit
6 x 8 x 5mm hexagon (9 cavaties) – Set of 3	17177A-3	3 trays
2 x 15 x 5mm (9 cavities) – Set of 3	17177B-3	3 trays
13 x 19 x 5mm (9 cavities) – Set of 3	17177C-3	3 trays

Light & Electron Microscopy

Grids & Grid Accessories

	Catalog #	Size
Carbon Black, Partially Graphitized Specimens are supplied on 3mm copper grids. Imaging of graphite planes forms a stable high resolution test. Planar spacing is: 0.34nm (corresponding to the {0001} crystal planes). 	23164-1	1 std.
Carbon, graphitized *HM5g* Used as size standard for Electron Microscopy. The primary particle size is 27 – 30 micron but there are also large secondary aggregate modes.	08441-1	1 g
Catalase Specimen Negatively stained catalase crystals show lattice plane spacings of approximately 8.75 and 6.85 nm very clearly (using TEM and STEM). Specimens are supplied on 3mm copper grids.	23166-1	1 std.
Gold Particles on Carbon Point to Point Resolution Specimen, 5 – 150nm A well established SEM resolution test both for SE and BSE images. The gold particles are on a carbon substrate and within a square grid pattern. The larger particles tend to be located in the central area of the grid. Two standards are available, each with a different range of particles sizes for successively higher resolution checking. 	22938-1	1 std.

Grids – Aluminum

Grids for Special Applications

Aluminum Grids 100 mesh	22895-1	25 grids
Aluminum Grids 200 mesh	22896-1	25 grids

Grids – Carbon Coated

Copper 200 mesh	24918-25	25 grids
	24918-50	50 grids
	24918-100	100 grids
Copper 300 mesh	24933-25	25 grids
	24933-50	50 grids
	24933-100	100 grids
Copper 400 mesh	24948-25	25 grids
	24948-50	50 grids
	24948-100	100 grids
Gold 200 mesh	24920-25	25 grids
	24920-50	50 grids
	24920-100	100 grids
Gold 300 mesh	24935-25	25 grids
	24935-50	50 grids
	24935-100	100 grids
Gold 400 mesh	24950-25	25 grids
	24950-50	50 grids
	24950-100	100 grids
Nickel 200 mesh	24919-25	25 grids
	24919-50	50 grids
	24919-100	100 grids

Light & Electron Microscopy

	Catalog #	Size
Nickel 300 mesh	24934-25	25 grids
	24934-50	50 grids
	24934-100	100 grids
Nickel 400 mesh	24949-25	25 grids
	24949-50	50 grids
	24949-100	100 grids

Grids - Formvar Coated

Copper 200 mesh	24912-25	25 grids
	24912-50	50 grids
	24912-100	100 grids
Copper 300 mesh	24927-25	25 grids
	24927-50	50 grids
	24927-100	100 grids
Copper 400 mesh	24942-25	25 grids
	24942-50	50 grids
	24942-100	100 grids
Gold 200 mesh	24914-25	25 grids
	24914-50	50 grids
	24914-100	100 grids
Gold 300 mesh	24929-25	25 grids
	24929-50	50 grids
	24929-100	100 grids
Gold 400 mesh	24944-25	25 grids
	24944-50	50 grids
	24944-100	100 grids
Nickel 200 mesh	24913-25	25 grids
	24913-50	50 grids
	24913-100	100 grids
Nickel 300 mesh	24928-25	25 grids
	24928-50	50 grids
	24928-100	100 grids
Nickel 400 mesh	24943-25	25 grids
	24943-50	50 grids
	24943-100	100 grids

Grids – Formvar/Carbon Coated

Copper 200 mesh	24915-25	25 grids
	24915-50	50 grids
	24915-100	100 grids
Copper 300 mesh	24930-25	25 grids
	24930-50	50 grids
	24930-100	100 grids
Copper 400 mesh	24945-25	25 grids
	24945-50	50 grids
	24945-100	100 grids
Gold 200 mesh	24917-25	25 grids
	24917-50	50 grids
	24917-100	100 grids

Light & Electron Microscopy

	Catalog #	Size
Gold 300 mesh	24932-25	25 grids
	24932-50	50 grids
	24932-100	100 grids
Gold 400 mesh	24947-25	25 grids
	24947-50	50 grids
	24947-100	100 grids
Nickel 200 mesh	24916-25	25 grids
	24916-50	50 grids
	24916-100	100 grids
Nickel 300 mesh	24931-25	25 grids
	24931-50	50 grids
	24931-100	100 grids
Nickel 400 mesh	24946-25	25 grids
	24946-50	50 grids
	24946-100	100 grids

Grids – Hexagonal Mesh

Standard – 100 mesh (Copper/Nickel)	18946C-1	100 grids
	18946N-1	100 grids
	18946N-10	10 vials
Standard – 150 mesh (Copper/Nickel)	18947C-1	100 grids
	18947C-10	10 vials
	18947N-1	100 grids
Standard – 200 mesh (Copper/Nickel)	18948C-1	100 grids
	18948C-10	10 vials
	18948N-1	100 grids
	18948N-10	10 vials
Standard – 300 mesh (Copper/Nickel)	18949C-1	100 grids
	18949C-10	10 vials
	18949N-1	100 grids
Standard – 400 mesh (Copper/Nickel)	18950C-1	100 grids
	18950C-10	10 vials
	18950G-1	100 grids
	18950N-1	100 grids
	18950N-10	10 vials
Thin Bar, High Definition – 200 mesh (Copper/Nickel)	7801C-1	100 grids
	7801C-10	10 vials
	7801N-1	100 grids
Thin Bar, High Definition – 200 mesh (Gold)	7801G-1	100 grids
Thin Bar, High Definition – 300 mesh (Copper/Nickel)	7803C-1	100 grids
	7803N-1	100 grids
Thin Bar, High Definition – 400 mesh (Copper/Nickel)	7805C-1	100 grids
	7805N-10	10 vials
	7805N-1	100 grids
Thin Bar, High Definition – 600 mesh (Copper/Nickel)	7806C-1	100 grids
	7806C-10	10 vials

Light & Electron Microscopy

Grids - Holey Carbon Coated

	Catalog #	Size
Copper 200 mesh	24921-25	25 grids
	24921-50	50 grids
	24921-100	100 grids
Copper 300 mesh	24936-25	25 grids
	24936-50	50 grids
	24936-100	100 grids
Copper 400 mesh	24951-25	25 grids
	24951-50	50 grids
	24951-100	100 grids
Gold 200 mesh	24923-25	25 grids
	24923-50	50 grids
	24923-100	100 grids
Gold 300 mesh	24938-25	25 grids
	24938-50	50 grids
	24938-100	100 grids
Gold 400 mesh	24953-25	25 grids
	24953-50	50 grids
	24953-100	100 grids
Nickel 200 mesh	24922-25	25 grids
	24922-50	50 grids
	24922-100	100 grids
Nickel 300 mesh	24937-25	25 grids
	24937-50	50 grids
	24937-100	100 grids
Nickel 400 mesh	24952-25	25 grids
	24952-50	50 grids
	24952-100	100 grids

Grids – Lacey Carbon Coated

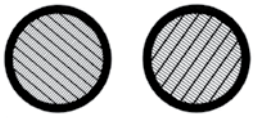
Copper 200 mesh	24924-25	25 grids
	24924-50	50 grids
	24924-100	100 grids
Copper 300 mesh	24939-25	25 grids
	24939-50	50 grids
	24939-100	100 grids
Copper 400 mesh	24954-25	25 grids
	24954-50	50 grids
	24954-100	100 grids
Gold 200 mesh	24926-25	25 grids
	24926-50	50 grids
	24926-100	100 grids
Gold 300 mesh	24941-25	25 grids
	24941-50	50 grids
	24941-100	100 grids
Gold 400 mesh	24956-25	25 grids
	24956-50	50 grids
	24956-100	100 grids

Light & Electron Microscopy

	Catalog #	Size
Nickel 200 mesh	24925-25	25 grids
	24925-50	50 grids
	24925-100	100 grids
Nickel 300 mesh	24940-25	25 grids
	24940-50	50 grids
	24940-100	100 grids
Nickel 400 mesh	24955-25	25 grids
	24955-50	50 grids
	24955-100	100 grids

Grids – Parallel Bar Pattern

Parallel Bar Pattern Grids



Copper 100/400 mesh	8425C-1	100 grids
Copper 75/300 mesh	8424C-1	100 grids
Nickel 75/300 mesh	8424N-1	100 grids

Grids – Slot

Copper 2 x 0.5mm slot	7565C-1	100 grids
	7565C-10	10 vials
Copper 2 x 1.0mm slot	7563C-1	100 grids
	7563C-10	10 vials
Nickel 2 x 0.5mm slot	7565N-1	100 grids
	7565N-10	10 vials
Nickel 2 x 1.0mm slot	7563N-1	100 grids
	7563N-10	10 vials

Grids – Special Applications

Aluminum Grids 200 mesh	22896-1	25 grids
Nylon Grids, Carbon Coated 150 mesh	22894-1	25 grids

Light & Electron Microscopy

Grids – Square Mesh

Thin Bar – High Definition

	Catalog #	Size
Copper 1000 mesh	7556C-1	25 grids
Copper 200 mesh	7800C-1	100 grids
	7800C-10	10 vials
Copper 300 mesh	7802C-1	100 grids
Gold 200 mesh	7800G-1	100 grids
	7800G-10	10 vials
Gold 300 mesh	7802G-1	100 grids
Gold 400 mesh	7804G-1	100 grids
Nickel 1000 mesh	7556N-1	25 grids
Nickel 200 mesh	7800N-1	100 grids
	7800N-10	10 vials
Nickel 300 mesh	7802N-1	100 grids
	7802N-10	10 vials

Grids – Square Mesh – Thick Thin Pattern
3.05mm diameter

Copper 200 mesh	7779C-1	100 grids
	7779C-10	10 vials
Copper 600 mesh	7780C-1	100 grids
Nickel 200 mesh	7779N-1	100 grids
Nickel 600 mesh	7780N-1	100 grids

Grids – Square Mesh – Standard

Copper 100 mesh	7550C-1	100 grids
	7550C-10	10 vials
Copper 150 mesh	7551C-1	100 grids
	7551C-10	10 vials
Copper 200 mesh	7552C-1	100 grids
	7552C-10	10 vials
Copper 300 mesh	7553C-1	100 grids
Copper 400 mesh	7554C-1	100 grids
	7554C-10	10 vials
Copper 50 mesh	7548C-1	100 grids
	7548C-10	10 vials
Cu/Pd 200 mesh	7552P-1	100 grids
	7552P-10	10 vials
Cu/Pd 300 mesh	7553P-1	100 grids
Cu/Pd 400 mesh	7554P-1	100 grids
Gold 100 mesh	7550G-1	100 grids
	7550G-10	10 vials
Gold 150 mesh	7551G-1	100 grids
Gold 200 mesh	7552G-1	100 grids
	7552G-10	10 vials

Light & Electron Microscopy

	Catalog #	Size
Gold 300 mesh	7553G-1	100 grids
Gold 400 mesh	7554G-1	100 grids
Nickel 100 mesh	7550N-1	100 grids
	7550N-10	10 vials
Nickel 150 mesh	7551N-1	100 grids
Nickel 200 mesh	7552N-1	100 grids
	7552N-10	10 vials
Nickel 300 mesh	7553N-1	100 grids
	7553N-10	10 vials
Nickel 400 mesh	7554N-1	100 grids
	7554N-10	10 vials
Nickel 75 mesh	7549N-1	100 grids

Tweezers

Polysciences has offered fine tweezers for use in scientific laboratories for decades. Our selection is based on our experience and understanding of your needs. We proudly offer Dumont and Rubis tweezers. Both brands are hand made in Switzerland of stainless steel and enjoy well deserved reputations in the industry. Inox is an alloy which contains chromium added to carbon steel. Inox forceps are magnetic. Tweezers are arranged by numbers 2, 3 and 5 which vary by increasing fineness of tip. Standard tips for general work and extra fine biology grade tips for handling grids and other EM work are available. *Tweezers are offered for research and investigational use only and not intended for food, drug, cosmetic or household use.*

Reverse Action Tweezers . . . . . 08620-1 — 1 pair
Finer than standard points, but not as fine as biology grade, 115mm in length.

Ceramic Tip Tweezers . . . . . 19382-1 — 1 pair
Polyacetal handle, 130mm in length.

from left to right: A, B, C, D, E, F, G

Dumont INOX

2, standard tip, 120mm. (See A)	23554-1	1 pair
	23554-12	dozen
3, biology grade, 120mm. (See B)	21972-1	1 pair
	21972-12	dozen
3C, biology grade, 120mm. (See B)	21973-1	1 pair
	21973-12	dozen
3C, non-magnetic, standard tip, 120mm. (See B)	07383-1	1 pair
	07383-12	dozen
3C, standard tip, 120mm. (See B)	07377-1	1 pair
3C, standard tip, 120mm. (See B)	07377-12	dozen
5, biology grade, 110mm. (See A)	21974-1	1 pair
	21974-12	dozen
5, standard tip, 110mm. (See A)	07379-1	1 pair
	07379-12	dozen

Light & Electron Microscopy

	Catalog #	Size
5A, standard oblique grade, 135mm. (See D)	23552-1	1 pair
	23552-12	dozen
7, biology grade, 115mm. (See E)	21975-1	1 pair
	21975-12	dozen
SS, non-magnetic, standard tip, 135mm. (See C)	23553-1	1 pair
	23553-12	dozen
Rubis		
3, standard tip, 120mm (See B)	07376-1	1 pair
	07376-12	dozen
3C, non-magnetic, standard tip, 110mm (See B)	07384-1	1 pair
	07384-12	dozen
5, standard tip, 110mm (See A)	07380-1	1 pair
	07380-12	dozen
7, standard tip, 115mm (See B)	07382-1	1 pair
	07382-12	dozen
General Use, 140mm, 5.5" (See E)	25048-1	1 pair
Reverse Action, 160mm, 6.33"	25052-1	1 pair
SS, standard tip, 135mm (See C)	23557-1	1 pair
	23557-12	dozen
Sturdy Strong Pointed, 115mm, 4.5"	25046-1	1 pair
Ultra Fine Pointed Angled, 110mm, 4.33"	25047-1	1 pair
Ultra Fine Pointed Curved, 110mm, 4.33"	25049-1	1 pair
Ultra Fine Pointed Curved, 115mm, 4.5"	25050-1	1 pair
Ultra Fine Straight Pointed Precision Tip, 120mm, 4.75"	25045-1	1 pair
with 8X Magnifier, 100mm, 4"	25051-1	1 pair

Dyes & Stains

Lead Citrate Trihydrate [512-26-5] *HM5g* . . . . . 00378-100 100 g
MW 1,053.8
The most popular lead stain for EM applications. Available in ready-to-use.
J. Cell Biol., 17, 208 (1963); J. Cell Biol., 25, 407 (1965)

Lead (II) Nitrate, 99% (ACS Reagent) [10099-74-8] *BHV7g* . . . . . 00785-100 100 g
MW 331.20 d 4.53
Used by Reynolds to make Lead Citrate, carbonate free.
Stains and Cytochemical Methods, Plenum Press, 223 (1993)

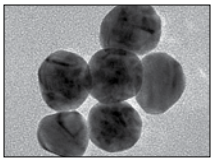
Thiocarbohydrazide [2231-57-4] *HPW7g* . . . . . 01211-5 5 g
(Carbonothioic dihydrazide; Thiocarbazide) MW 102.15 mp 171° (dec.) 01211-25 25 g
Useful for the histochemical and ultracytochemical demonstration of glycomacro-molecules. Also useful for the enhancement of the fine structure of cytomembranes by osmium-thiocarbohydrazide bridging. Requires Poison Pack Technical Data Sheet #184
J. Histochem. Cytochem., 29, 682 (1981); 32, 455 (1984)

Lead Citrate, Powdered Fines Grade (< 5 µm) [512-26-5] *HM5g* . . . . . 25350-100 100 g
MW 1,053.8
The most popular lead stain for EM applications. Carbonate free material. Appearance: Powdered
Reynolds, J. Cell Biol., 17, 208 (1963) Venable and Coggeshall, J. Cell Biol., 25, 707 (1965)

Light & Electron Microscopy

Immunogold Labeling Reagents

Highly protected covalent polymer layer for a wide variety of pH and salt environments. Highly monodisperse in size and shape. Available in four popular in vitro terminations including amine, carboxyl, methyl, and neutravidin.



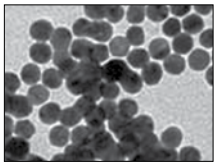
Close up of 30nm spheres showing the monodispersity

	Catalog #	Size
Amine Terminated Polymer Coated Nanoparticles		
15nm	24876-1	1 ml
20nm	24877-1	1 ml
30nm	24878-1	1 ml
Carboxyl Terminated Polymer Coated Nanoparticles		
15nm	24870-1	1 ml
20nm	24871-1	1 ml
30nm	24872-1	1 ml
Methyl Terminated Polymer Coated Nanoparticles		
15nm	24879-1	1 ml
20nm	24880-1	1 ml
30nm	24881-1	1 ml
Neutravidin Terminated Polymer Coated Nanoparticles		
15nm	24873-1	1 ml
20nm	24874-1	1 ml
30nm	24875-1	1 ml

Mercaptyalkyl PEG Gold Nanoparticles . . . . . 24688-5 5 ml

Nanoparticle conjugate. Technical Data Sheet #787

A.G. Kanaras, F.S. Kamounah, K. Schaumburg, C.J. Kiely, M. Brust. Thioalkylated tetraethylene glycol: a new ligand for water soluble monolayer protected gold clusters. Chem. Comm. 2002, 20, 2294.



Naked Gold Nanoparticles *CH4g* . . . . . 24689-5 5 ml

5 – 8nm bare gold nanoparticles in toluene stabilized by loosely adsorbed tetraoctylammonium bromide.

M. Brust, D. Bethell, D.J. Schiffrin, C. Kiely. Novel Gold-Dithiol Nano-Networks with Non-metallic Electronic Properties. Adv. Mater. 1995, 7, 795. M. Brust, D. Bethell, C. J. Kiely, D. J. Schiffrin. Self-Assembled Gold Nanoparticle Thin Films with Non-M

Chloroauric acid [16961-25-4] *H5bd* . . . . . 00395-1 1 g

MW 393.8 d 3.90

Used for production of colloidal gold solutions.

Colloidal Gold Solution, 0.005%, 15-25nm *U2w* . . . . . 09285-50 50 ml

Colloidal gold has been widely used to make bioconjugate probes for labeling and visualizing biologic specimens via light and electron microscopy. Most proteins can be easily coupled to colloidal gold particles with retention of the bound protein's biological activity.

Technical Data Sheet #787

Light & Electron Microscopy

Unconjugated Gold Colloid (GC) *A2dmw*
PolyGold reagents are of the highest quality and can be relied upon to give reproducible results. For TEM studies, the most convenient sizes of gold particles are 5nm, 10nm and 15nm. The long shelf life (12 months when stored at 4° C) makes the use of these reagents economical. Resolution of most SEMs is such that immunolabeling studies require either the use of larger sized gold particles or enhancement of smaller gold particles using silver enhancement (deposition) technology. Accordingly, the gold colloids listed below include 20nm, 30nm and 40nm particles for direct visualization in the SEM.

Benefits:
- High specificity
- Low clustering – agglomeration of gold particles is minimal, over 85% of particles being singlets
- Discrete particle sizing – narrow particle size distribution allows double labeling to be achieved

	Catalog #	Size
5nm	22716-100	100 ml
10nm	22717-100	100 ml
15nm	22718-100	100 ml
20nm	22719-100	100 ml
40nm	22720-100	100 ml
60nm	22703-100	100 ml

Accessories

Diamond Knives
Polysciences has been selling diamond knives to satisfied users for over 20 years. We guarantee your satisfaction. These are the highest quality diamond knives available and can be repeatedly resharpened. See website for additional ordering information. Technical Data Sheet #261

Standard 2.0mm edge length	08452-1	1 knife
Standard 2.5mm edge length	08453-1	1 knife
Standard 3.0mm edge length	08454-1	1 knife
Standard 3.5mm edge length	08455-1	1 knife
Standard 4.0mm edge length	18383-1	1 knife

Glass Knife Storage Box . . . . . 16659-1 — 1 box
A useful way of storing triangular glass knives. The silicone rubber insert in the plastic box will hold ten 25mm (1 inch) knives firmly in position.

Glass Scoring Jig . . . . . 23274-1 — 1 unit
An aid for producing 25.4mm glass knives by hand method. When the edge of the T square is placed against the edge of the glass strip the subsequent score will be 25.4mm long. After breaking, the square of the glass can be scored at 45° using the other jig. Used in conjunction with our diamond glass scriber *(Cat. #03636).*

Glass, Ultra Microtome
High quality, clean glass strips cut to close size requirements to ensure they will fit all knifemakers. Glass is pre-cleaned and individually wrapped. Available in a variety of sizes and thicknesses for both ultramicrotomy and histology, as well as Ralph knives.

100mm x 50mm x 12mm thick	19748-1	20 strips
380mm x 25mm x 6mm thick	08421-10	10 strips
	08421-30	30 strips

Light & Electron Microscopy

	Catalog #	Size
380mm x 38mm x 6mm thick	16844-20	20 strips
PolyCut-Ease *A2g* . . . . . The addition of 1% PolyCut-Ease to any epoxy embedding recipe will enable many stress free sections to be cut from a single area of a knife. It preserves the life of your diamond knife edge as it markedly reduces friction of the knife as it cuts through the plastic. The additive will not change the block color or EM image quality. Does not contain Silicone. Technical Data Sheet #385 *H.J. of EM Tech., 3, 217 (1986)*	18615-100	100 ml
Tungsten Carbide Blades, Disposable . . . . . 100% solid high grade tungsten carbide. Recommended for hard tissue, bone or material embedded in MMA or GMA, frozen.	24234-1	3 blades
Tungsten Carbide Knives, Triangular . . . . . Excellent for sectioning hard samples, GMA, Epoxy resins. Replace glass and razor blades in a variety of sectioning and block facing applications. Durable edge lasts through thousands of sections, eliminating mid-procedure knife changes, enhancing productivity. Fits tightly in the glass knife holders of most microtomes. 3 knives per package.	24233-1	3 knives

Fluorescent Dyes & Stains

Acridine mutagen ICR 191 [17070-45-0] *HU6bg* . . . . . 08704-100 100 mg

([6-Chloro-9-(3-[2-chloroethylamino]propylamino)-2-methoxyacridine] dihydrochloride; ICR 191 Acridine mutagen; Ames mutagen 191) MW 451.2
Frameshift mutagenic standard for Ames test in *Salmonella* and *E. Coli*.
Science, 176, 47 (1972); Ann. N.Y. Acad. Sci., 269, 21 (1975); J. Med. Chem., 15, 739 (1972); Proc. Nat'l. Acad. Sci., USA, 72 5135 (1975)

Acridine Orange, C.I. 46005, very high purity [65-61-2] *HU5e* . . . . . 04539-500 500 mg
04539-5 5 g

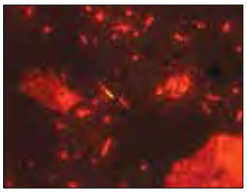
(3,6-Bis[dimethylamino]acridine hydrochloride hydrate) MW 301.83
DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Free of inorganic salts. A specific stain for RNA, used as a 2% solution containing 1% lanthanum acetate in 15% acetic acid. λ max 494 ± 4nm
J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001); J. Lab Med., 15(3), 180 (1984)

2% Acridine Orange, Ready-to-Use [65-61-2] *HU5d* . . . . . 24603-10 10 ml

Ultrapure DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Ready-to-use and free of inorganic salts. A specific stain for RNA, used as a 2% solution. Ready-to-use format eliminates the exposure to potentially irritating powdered dyes.
J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001) J. Lab Med., 15(3), 180 (1984)

Auramine O Stain Kit . . . . . 24665-1 1 kit

Acid-fast mycobacteria resist decolorization by acid-alcohol after primary staining owing to the high lipid (mycolic acid) content in their cell walls. The identification of mycobacteria with auramine O is due to the affinity of the mycolic acid in the cell walls for the fluorochromes. The dye will bind to the mycobacteria, which appear as bright yellow luminous rods against a dark background. The potassium permanganate helps prevent non-specific fluorescence. Technical Data Sheet #751

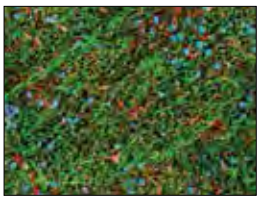


M. tuberculosis in a sputum smear is stained using fluorescent auramine with acridine orange counterstain; 950x. CDC Public Health Library.

Fluorescent Dyes & Stains

	Catalog #	Size
Bisbenzimide (Hoechst 33258) [23491-45-4] *H4abd*	09460-100	100 mg

(2′-[4-Hydroxyphenyl]-5-[4-methyl-1-piperazinyl]-2,5′-bi-1H-benzimidazole trihydrochloride pentahydrate; Hoechst 33258) MW 623.97 $C_{27}H_{37}Cl_3N_6O_4$
Fluorescent chromosome stain. Recommended use is 10mg/ml for 2 – 10 minutes. This will vary based on section thickness.
Science, 220, 620 (1983), Anal. Biochem., 179, 401 (1989)



Rat Brain Sagittal, 8 micrometer section, stained with Hoechst 33342, Alexa Fluor 568-6FAP (Rb) and Alexa Fluor 488-NF-P (Ms). Photo: Mike Davidson of Florida State University.

Calcein, 2,4-Bis(N,N′-di[carboxymethyl]aminomethyl) fluorescein [1461-15-0] *U5f*	03321-1	1 g

(DCAF) MW 622.65
Fluorescent bone density stain. Also used for determination of serum magnesium.
Stain Technology, 62, 247, (1987)

Coumarin 1 [91-44-1] *A2g*	24185-250	250 g

(7-Diethylamino-4-methylcoumarin; 7-Diethylamino-4-methyl-1-benzo-pyran-2-one) MW 231.3
Fluorescent dye, miscible in ethanol or neutral buffer.

Coumarin 6, laser grade *U7g*	8037L-100	100 mg

MW 350.44
For pulsed and CW operation in the green-blue spectral region. Tunable from 515-585nm. Absorption max (in ethanol): 458nm Optimum lasing (in ethanol): 540nm, Fluorescence max (in ethanol): 505nm

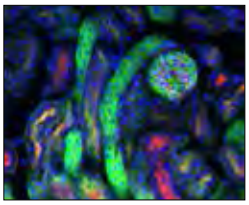
Cyanoditolyl Tetrazolium Chloride (CTC) [102568-47-8] *HU6ad*	19292-100	100 mg
	19292-1	1 g

MW 311.8 mp 230° Soluble in ~100mg in 6.6cc water.
Cyanoditolyl tetrazolium chloride has been used to measure the redox activity of tumor cells. It has also been employed for direct epifluorescent microscopic enumeration of respiring bacteria in food samples and environmental samples, especially water samples. Reveals a quantitative methodology for measuring marine bacteria. These methods yield 80% activity in 2 to 10 minutes. Cell samples mixed with CTC can be stored refrigerated or frozen in liquid nitrogen for at least 4 weeks without a significant loss of cells. Formazan fluoresces in solid state. Em. max: 630nm Ex. max: 450nm Technical Data Sheet #486
Histochem. J. 19, 21 (1987); Appl. Environ. Microbiol., 58, 1801 (1992); Appl. Environ. Microbiol., 65(5), 1966 (1999); Appl. Environ. Microbiol., 69(4), 2166 (2003); Flow Cytometric Analysis: Appl. Environ. Micro. June 1999, p. 2409-2417 Vol. 65 (6)

E. coli bacteria in CTC.

4′,6-Diamidino-2-phenylindole dihydrochloride (DAPI) [28718-90-3] *U3acd*	09224-10	10 mg
	09224-50	50 mg

MW 350.25
A cationic fluorescent dye which specifically binds to adenine-thymine-rich DNA. Applications include detection of nanogram quantities of DNA in cellular homogenates, and cytofluorometric determination of the DNA base content in human chromosomes. *Available in bulk quantities for OEM users at significant savings.* λ max: 342nm Technical Data Sheet #444
Nature, 253, 461 (1975); Anal. Biochem., 92, 497 (1979); Stain Technol., 60, 7 (1985); Eur. J. Biochem., 182, 437 (1989)



Mouse Kidney cells were stained with DAPI, Alexa Fluor® 488 wheat germ agglutinin, Alexa Fluor® 568 phalloidin. Contributed by Walt Metcalfe, Molecular Probes, Inc.; photographed by Gregg Jarvis, Omega Optical, Inc.

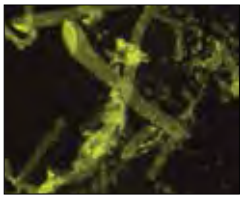
2′,7′-Dichlorofluorescein [76-54-0] *H4g*	05134-10	10 g

MW 401.21
0.2% Solution in ethanol can be used for the detection of saturated and unsaturated lipids.
λ max: 509nm

Fluorescent Dyes & Stains

	Catalog #	Size
Ethidium bromide [1239-45-8] *H5g* (Homidium bromide; 3,8-Diamino-5-ethyl-6-phenylphenanthridium bromide;2,7-diamino-10-ethyl-9-phenylphenanthridium bromide) MW 394.32 mp 260 – 262° (dec.) Intercalates double-stranded nucleic acids; frameshift mutagen; fluorescent stain for nucleic acids in electrophoresis; used for DNA quantitation. *J. Mol. Biol., 47, 419 (1970); Ann. Rev. Biochem., 44, 273 (1975); Dev. Biol., 108, 325 (1985)*	04033-5	5 g
Fast Blue [74749-42-1] *U7g* Soluble in water, lower alcohols. Fluorescent dye commonly used as a neuronal tracer and referred to as a hydrophilic retrograde tracer. Fast Blue can be used alone or with other types of fluorescent retrograde and anterograde tracer dyes. Other neuronal tracers such as True Blue, Evans Blue and Nuclear Yellow are commonly used in conjunction with Fast Blue. *Adv. Cell. Neurobiol., 5, 307 (1984); J. Anat. Soc. India 48(2) 67-72-1999*	17740-1 17740-2 17740-5	1 mg 2 mg 5 mg
Filipin (from Streptomyces filipinensis) [11078-21-0] *HO6d* Polyene antibiotic fluorochrome for cholesterol determination. Used as an antifungal agent. *Cytometry, 8, 146 (1987)*	08707-50 08707-100	50 mg 100 mg
Fluorescein diacetate [596-09-8] *A2f* (Diacetylfluorescein; 3,6-Diacetoxyfluoran) MW 416.39 mp 198 – 201° Lipase substrate. Also a fluorescent substrate in studies on membrane permeability and intracellular interactions. λ max: 494nm *Anal. Chem., 36, 409 (1964); J. Biol. Chem., 258, 6380 (1983)*	00615-5	5 g
Fluorescein, Sodium Salt, C.I. 45350 [518-47-8] (Acid Yellow, Uraine) MW 376.27 $C_{20}H_{10}Na_2O_5$ Fluorescein sodium is used extensively as a diagnostic tool in the field of ophthalmology and optometry. Topical fluorescein is used for the diagnosis of corneal abrasions, ulcers and herpetic corneal infections. *Merck 13, 4185, Beilstein 19, IV, 2904*	24997-100 24997-500	100 g 500 g
Fungi-Fluor® Kit for Fungal Detection	17442-1	1 kit

Many opportunistic infections develop in the immunosuppressed patient suffering from AIDS. A number of these are caused by various fungal species including Candida, Aspergillus, Histoplasma, and Coccidioides. Fungi-Fluor Kit for Fungal Detection offers a quick fluorescent stain/counterstain procedure for various fungal organisms. Can be used to screen a variety of specimen types from sputum to skin scrapings for fungal detection. Technical Data Sheet #316



Aspergillus culture stained with Fungi-Fluor®, no counterstain, 40X, FITC filter.

Benefits:

- More accurate than KOH preps
- Rapidly offers greater morphologic detail than PAS or silver stains
- Counterstain greatly reduces background fluorescence
- One kit stains over 500 slides
- FDA approved for in vitro diagnostic use in the United States

Specimen types:

- Fresh or frozen clinical specimen
- Paraffin or GMA-embedded tissues

Kit Contains:

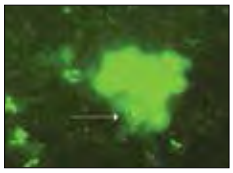
- 75ml of staining solution A
- 75ml of counterstaining solution B

Fungi-Fluor® Kit for Fungal Detection is sold in Europe under (Cat. #17442E-1). For European orders, please call or visit our website.

Fluorescent Dyes & Stains

	Catalog #	Size
Fungi-Fluor® Pneumocystis Kit *HU2agm*	22363-1	1 kit

Pneumocystis carinii is an organism that can cause *Pneumocystis carinii* pneumonia (PCP) in severely immune compromised patients. Early detection allows the introduction of appropriate treatment and may improve the chances of patient survival. The Fungi-Fluor® Pneumocystis Kit offers a fast, fluorescent staining procedure for *Pneumocystis carinii* in bronchial specimens. 100 tests per kit. Technical Data Sheet #482



Benefits:

- Direct fluorescent stain for *Pneumocystis carinii* cyst
- Unique fluorescent morphology ("double parenthesis" structure) is easy to identify
- 3 minutes to stain and read
- Permanent slides – slides can be reactivated if fluorescence dims
- Minimal prep and clean-up
- Better results than with methenamine silver staining
- FDA approved for in vitro diagnostic use in the United States

Specimen Types:

- Bronchoalveolar lavage (BAL)
- Bronchial brush or wash
- Touch prep of fresh tissue
- Paraffin section and frozen sections

Kit Contains:

- 10ml of Fungi-Fluor® staining solution
- 10 positive unstained control slides (smears)

Fungi-Fluor® Pneumocystis Kit is sold in Europe under (Cat. #22363E-1). For European orders, please call or visit our website.

Hanker-Yates reagent *HVWX7d*	08661-5	5 x 1 g

A specific, sensitive and non-carcinogenic chromogen for immunoperoxidase techniques. Contains p-phenylenediamine and pyrocatechol. Gives a blue reaction product.
Technical Data Sheet #204
Histochem. J., 9, 789 (1977); Am. J. Clin. Path., 75, 367 (1981)

Hydroethidine™ (Dihydroethidium bromide) [104821-25-2] *HU5cd*	17084-50	50 mg

MW 315.5 mp 202 – 206°
Reduced ethidium bromide. A vital stain. Enters and stains living cells without cellular trauma. Double staining system. Stains cytoplasm blue and chromatin red. Excellent cellular retention. Remains incorporated in chromatin with virtually no leakage. Essentially non-toxic. Shows no toxicity at levels useful for visualizing chromatin. Em. max: 420nm Ex. max: 365nm
Technical Data Sheet #351
Biotechnology, 3, 4 (1985)

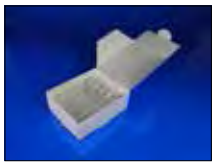
Indocyanine green [3599-32-4] *HK3g*	08263-50	50 mg

(Cardiogreen; Fox green) MW 774.99
Dye for hemodynamic studies. Technical Data Sheet #1018
Invest. Ophthalmol., 13, 77 (1974)

Lissamine Rhodamine B sulfonyl chloride, ~99% [62796-29-6] *H3g*	08074-100	100 mg

MW 577.1
Fluorescent protein stain with bright orange fluorescence. Used to visualize actin filaments in living amoebas. Useful for waste water testing and various microbiological applications.
J. Cell. Biol. 86, 590 (1980)

Fluorescent Dyes & Stains

	Catalog #	Size
Mithramycin [18378-89-7] *VWX7f* (Plicamycin; Aureolic acid; Mithracin) MW 1,085.18 mp 180 – 183° Fluorescent DNA dye. *Stain Technol., 60, 145 (1985); Merck Index 11, 7510*	09330-5	5 mg
Naphthalene-2,3-dicarboxaldehyde [7149-49-7] *HY4g* MW 184.19 mp 131 – 133° Highly Purified Grade-single spot TLC Fluorogenic derivatizing agent for amines. Useful for fluorescent determination of serum arginine and for trace amino acid and peptide analysis.	21486-100	100 mg
Nitroblue tetrazolium chloride (NBT) [298-83-9] *HU6ae* MW 817.65 mp 215 – 217° Used for estimating dehydrogenases and other oxidases. Also used in the detection of nucleic acid hybridization and in the detection of ascorbate peroxidase activity in native gels. Totally soluble and formazan free. *Methods Enzymol., 6, 958 (1963); Anal. Biochem., 56, 353 (1973); 212, 540 (1993), J. Clin. Lab. Anal., 7, 174 (1993)*	00928-500 00928-1	500 mg 1 g
Osmium ammine-B [48016-91-7] *U5g* Stable DNA stain. *J. Histochem. Cytochem., 37, 395 (1989)*	21033-100	100 mg
Pneumocystis carinii Control Slide *U2g* Designed to be used with our Fungi Fluor Kit Pneumocystis Kit *(Cat. #22363)*, these slides are unstained. Technical Data Sheet #483 	22251-1	10 slides
Propidium iodide [25535-16-4] *HVWX6g* MW 668.41 mp 220 – 225° Fluorescent marker. Used as a nuclear counterstain and for In situ Hybridization (ISH). λ max: 493nm *J. Histochem. Cytochem., 35, 123 (1987)*	03748-100	100 mg
Rhodamine B isothiocyanate, mixture of isomers [36877-69-7] *U5g* MW 536.1 Fluorescent marker for proteins. Also used as a counterstain in conjunction with FITC. *J. Bacteriol., 83, 1358 (1962); Arch. Biochem. Biophys., 133, 263 (1969)*	00374-250	250 mg
Rhodamine WT, 5% aqueous solution *H4g* Water leak tracing dye. Ex. max: 554nm Em. max: 579nm	19922-4	4 x 8 oz

Fluorescent Dyes & Stains

	Catalog #	Size
TB Fluorostain Kit	22422-1	1 kit

Fluorochrome staining of mycobacteria in an acid-fast smear offers several advantages over traditional carbol-fuchsin methods. Lower magnification is required; fluorescent mycobacteria stand out brightly on a darkened background. Smaller numbers of mycobacteria are easily identified with a fluorescent stain. 100 tests per kit. Technical Data Sheet #488

Features:

- Less than 12 minutes to perform staining
- Microwave method reduces time and enhances results
- Much less Auramine O and Rhodamine B used, reducing costs and hazards
- Faster, superior counterstain
- FDA approved for in vitro diagnostic use in the United States

Kit Contains:

- 525ml of Staining Solution A, 500ml of Acid Solution B & 500ml Counterstaining Solution C

Thiazole orange [107091-89-4] *H6gk*	19352-25	25 mg

MW 476.32 mp 270° (dec.)
Fluorescent dye for reticulocyte analysis. Also useful for Plasmodium species analysis. λ max: 512nm
Cytometry, 7, 508 (1986); 8, 568 (1987); Angew. Chem., 111, 2340-2343, (1999); Agnew. Chem. Int. Ed., 38, 2203-2206, (1999)

Uvitex® 2B [27344-41-8] *BH6g*	19517-10	10 g

(C.I. Fluorescent Brightener 362; Derivative of stilbene disulfonic acid.) TSCA
UV absorver. Em. max: 435nm in PBS Buffer Ex. max: 350nm
Appearance: Yellow powder

PSVue® Fluorescent Probes

PSVue® reagents are a family of fluorescent probes containing a bis(zinc2+dipicolylamine) group (Zn-DPA), a motif that has been found to bind with high affinity to surfaces enriched with anionic phospholipids,especially phosphatidylserine (PS) exposed on cell membranes. The fluorescent part of the probe is a reporter element that provides a means of detecting the probe once it is bound to the membrane of interest.

Key Features of PSVue® Probes:

- Bind to a variety of cell types which have negatively charged phospholipids exposed on their membranes including apoptotic Cells, necrotic cells, Gram+ and Gram- bacteria activated cells, tumor vascular endothelial cells, viruses, etc.
- Available in a range of detection wavelengths from long-UV to near infrared
- Suitable for in vitro and in vivo use
- Suitable for high-throughput screening assays
- Bind to the same PS site as annexin-V - angiogenesis, traumatic head injury, apoptosis

PSVue® 380	25102-1	1 kit

The PSVue®380 (formerly PSS-380) reagent kit contains components to provide ~0.40 mL of a 2 mM solution of PSVue®380 in 50% aqueous ethanol solution. The compound has an absorbance max at 380nm and a fluorescence emission max at 440nm. Provides a 10X increase in fluorescence intensity upon binding to anionic membranes. Technical Data Sheet #879

Kit Contains:

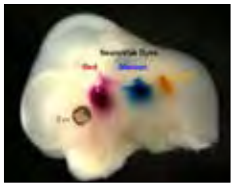
- Vial containing pre-weighed amount of apo-PSS380 solid dye (at least 0.5 mg)
- Vial of 8.4 mM zinc nitrate solution in water (0.5 mL)

Fluorescent Dyes & Stains

	Catalog #	Size
PSVue® 480 The PSVue®480 (formerly PSS-480) reagent kit contains components to provide ~0.5 mL of a 1 mM solution of PSVue®480 in 50% aqueous dimethylsulfoxide solution. The compound has an absorbance max at 480nm and an fluorescence emission max at 519 nm. Technical Data Sheet #880 Kit Contains: • Vial containing pre-weighed amount of apo-PSS480 solid dye (at least 0.5 mg) • Vial of 4.2mM zinc nitrate solution in water (0.5 mL)	25103-1	1 kit
New! PSVue® 550 MW 1,365 $C_{60}H_{61}N_{13}O_{17}Zn_2$ The PSVue® 550 reagent kit contains components to provide ~0.5 mL of 1 mM solution of PSVue® 550. The compound has an absorbance max at 553nm and fluorescence emission max at 615nm. Technical Data Sheet #1012	25684-1	1 kit
New! PSVue® 643 MW 1,641.4 $C_{70}H_{80}N_{13}O_{20}S_2Zn_2Na$ The PSVue643® kit contains 0.25mL of a 1mM solution of PSVue643® in water. The compound has an absorbance max at 643nm and a fluorescence emission max at 658nm. Technical Data Sheet #1013	25685-1	1 kit
PSVue® 794 The PSVue®794 (formerly PSS-794) reagent kit contains components to provide ~0.68 mL of a 1 mM solution of PSVue794 in aqueous solution. The compound exhibits absorbance and fluorescence excitation maximum at 794nm and emission maximum at 810nm. The labeling vehicle provided with the kit (Diluent X) is designed to maximize dye solubility and is suitable for in vitro and in vivo use. Technical Data Sheet #878 Kit Contains: • Vial containing pre-weighted amount of apo-PSS794 solid dye (at least 1 mg) • Vial of diluent X (1 ml) • Vial of 4.2mM zinc nitrate solution in diluents X (1 ml)	25101-1	1 kit
New! PSVue® Biotin MW 1,191 $C_{46}H_{55}N_{13}OSZn_2$ PSVue® Biotin can be complexed with streptavidin-coated quantum dots (not provided) for *in vivo* and *in vitro* use. Procedures to formulate PSVue® biotin and prepare the PSVue® biotin-streptavidin-coated quantum dot complex are provided. Vial contains 1mg of solid. Technical Data Sheet #1011	25683-1	1 kit

NeuroVue® Dyes

NeuroVue® Filter Squares For Neuronal Tract Tracing
NeuroVue® Dye Filters are useful tools in several different areas of research including neuronal tract tracing studies of up to 3 – 4 weeks and are spectrally compatible with most fluorescent light-absorbing tags. Technical Data Sheet #771



Monitoring diffusion distance using NeuroVue® dye absorbance in murine head (lateral view) embryonic day 12.5

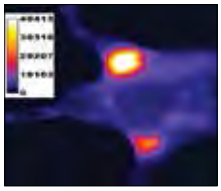
Burgundy	Em. Max 707nm	Ex. Max 683nm	24838-1	1 filter
Jade	Em. Max 507nm	Ex. Max 494nm	24837-1	1 filter
New! Jade Solid	Em. Max 508nm	Ex. Max 478nm	25687-1	1 mg
Maroon	Em. Max 667nm	Ex. Max 687nm	24834-1	1 filter
Maroon Solid	Em. Max 667nm	Ex. Max 647nm	25569-1	1 mg
Orange	Em. Max 570nm	Ex. Max 550nm	24836-1	1 filter
Red	Em. Max 588nm	Ex. Max 567nm	24835-1	1 filter
Red Plus	Em. Max 588nm	Ex. Max 567nm	24906-1	1 filter
Red Solid	Em. Max 588nm	Ex. Max 567nm	24907-1	1 mg

Fluorescent Dyes & Stains

				Catalog #	Size

SRFluor®

New! SRfluor® – Stable Squaraine Rotaxane Encapsulated Dyes *HU7g*
SRfluor® dyes are a class of dyes based on the squaraine rotaxane structure, which enable them to exhibit absorption and emission properties in the far-red region of the spectrum. SRfluor® dye products offer many superior features to regular labeling dyes, and are available with a wide range of functionalities allowing conjugation with biomolecules for in vitro and in vivo imaging. SRfluor® dyes have been successfully used to visualize intracellular structures such as ER and lipid droplets, metal ions, as well as bacterial cells and infections in mouse models. Provided in crystalline powder form. See website for individual spectra. *SRfluor® is a trademark of Molecular Targeting Technologies, Inc. Distributed by Polysciences, Inc. under agreement from MTTI.*



Optical image of a live mouse with subcutaneous injections of S. aureus and E. coli that were prelabeled with SRfluor probe. The entire animal was irradiated with filtered light at l=625 ±40 nm and an image with emission intensity at l=670 ±20 nm was coll

680 Alkyne	Abs. Max 649nm	Em. Max 673nm (in DMSO)	Technical Data Sheet #1015	25689-1	1 mg
680 Azide	Abs. Max 645nm	Em. Max 668nm (in DMSO)	Technical Data Sheet #1016	25688-1	1 mg
680 Carboxyl	Abs. Max 650nm	Em. Max 678nm (in DMSO)	Technical Data Sheet #901	24863-1	1 mg
680 Maleimide	Abs. Max 641nm	Em. Max 664nm (in ethanol)	Technical Data Sheet #902	24865-1	1 mg
680 NHS Ester	Abs. Max 650nm	Em. Max 678nm (in DMSO)	Technical Data Sheet #807	24866-1	1 mg
680 Phenyl	Abs. Max 650nm	Em. Max 678nm (in DMSO)	Technical Data Sheet #900	24862-1	1 mg

BioReagents

5-Amino-1,10-phenanthroline [54258-41-2] *U5g* . . . . . 09117-1 1 g
MW 195.19 mp 259 – 260°
Used for forming metal complexes to catalyze biological reactions. Also useful for protein adsorption when coupled to CM-cellulose.
Inorg. Chim. Acta, 50, 21 (1981); Toxicon, 15, 447 (1977)

Chloroauric acid [16961-25-4] *H5bd* . . . . . 00395-1 1 g
MW 393.8 d 3.90
Used for production of colloidal gold solutions.

Colchicine [64-86-8] *BHX6g* . . . . . 00345-500 500 mg
MW 399.4 mp 155 – 157°
An antimicrotubular effector. Interferes with microtubule organization by binding specifically with tubulin. Used for research in plant genetics.Requires Poison Pack
Microtubules 11 (1978), Springer-Verlag, Berlin

Diatrizoate sodium [737-31-5] *U2g* . . . . . 18152-100 100 g
(Sodium diatrizoate; 3,5-Diacetamido-2,4,6-triiodobenzoic acid, sodium salt; Hypaque sodium)
MW 635.92
Forms solutions of low viscosity and high density, and can be used along with an aggregating agent like Ficoll 400 for qualitative in vitro isolation of pure lymphocytes from whole blood by gradient centrifugation.
Scand. J. Clin. Lab. Invest., 21, suppl. 97 (1968)

1,4-Diazabicyclo(2,2,2)octane [280-57-9] *H4g* . . . . . 15154-25 25 g
MW 112.18 mp 160°
Stabilizer of dye solutions which have not been oxygen degassed.
J. Cellular Physiol., 149, 160 (1991)

BioReagents

	Catalog #	Size
Gelatin [9000-70-8] *A2g*	00639-100	100 g

Used for slide preparation for light microscope autoradiography and histochemistry. To make gelatin solution: to 500ml of D.I. water at 60° C add 0.5g gelatin and stir to dissolve. After the gelatin is dissolved add 0.05g of chromium potassium sulfate and let mixture cool to 40° C. Dip nitric acid cleaned slides into warm gelatin mixture and dry in clean environment. Store prepared slides in clean slide box.

N-(γ-L-Glutamyl)-4-methoxy-2-naphthylamine [24723-50-0] *HM7f*	02410-50	50 mg

MW 302.3 mp 178 – 183° $C_{16}H_{18}N_2O_4$

Used as a substrate for the histochemical demonstration of γ-glutamyl transpeptidase activity. Amino acid and chiral reagent. Purity based on dry form: 98% and Purity based on water content: 88%.

Glycerol, USP (Glycerine) [56-81-5] *A2g*	00084-100	100 g
	00084-1	1000 g

MW 92.09 bp 182°/20mm

Used as cryoprotectant to help prevent ice crystal damage to specimens. Substrate for the assay of glycerol dehydrogenase, glycerol oxidase, and glycerokinase.

Methods Enzymol., 1, 397 (1955); 42, 148 (1975); 89, 243 (1982)

Heparin, fluorescent [25036-25-3] *U5d*	16092-10	10 mg
	16092-100	100 mg

A Sodium Heparin from porcine intestinal mucosa with a molecular weight that ranges from 3,000 – 30,000 daltons. The strength, quality and purity meet pharmaceutical specifications. Porcine raw materials test negative for Prion agents due to an approved method of purification that removes TSE and viral agents. The activity of Sodium heparin averages 179 – 181u/mg. This Sodium heparin is bound to Fluorescein Isothiocyanate. Used in studies on metabolic fate of exogenously administered heparin.

1. Preparation of Biologically Active Fluorescent Heparin Composed of Fluorescein-Labeled Species and Its Behavior to Antithrombin III, Hideki UCHIYAMA and Kinzo NAGASAWA, J. Biochem., January 1981; 89: 185 – 192. 2. Preparation and properties of biologically active fluorescent heparins. Nagasawa K, Uchiyama H., Biochim Biophys Acta. 1978 Dec 1;544(2):430-40.i

Heparin, sodium salt (Sodium heparin, from porcine intestinal mucosa) *U4d*	01491-100	100M USP Units
	01491-5	5 x 100M USP Units

Anticoagulant. Heparin binds and activates the plasma protein antithrombin III which inhibits several enzymes in the blood coagulation cascade. Sodium heparin, from porcine intestinal mucosa.

Fed. Proc., 36, 10 (1977); Brit. J. Haematol., 41, 573 (1979)

Iodonitrotetrazolium chloride [146-68-9] *U6d*	00630-1	1 g

(Iodonitrotetrazolium violet; INT) MW 505.71 mp 240 – 245° (dec.)

Used for assay of dehydrogenases. Also used for staining hemopoietic colonies.

Anal. Biochem., 1, 317 (1960); 16, 427 (1966); Methods Enzymol., 9, 683 (1966); 22, 130 (1971); Clin. Chem., 19, 766 (1973); Exp. Hemat., 5, 551 (1977); Toxic Assess., 3, 41 (1988)

Nadic Methyl Anhydride (NMA) [25134-21-8] *adm*	00886-450	450 g

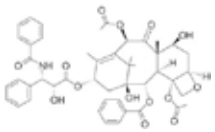
MW 178.2 n_D^{25} 1.505

Liquid anhydride for curing epoxy resins. This material is a mixture of methyl isomers of methylbicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic anhydride. The larger the proportion of NMA used in the epoxy resin formula, the harder the resultant block. Technical Data Sheet #PDS 890 and #PDS 892

BioReagents

	Catalog #	Size
New! Paclitaxel – from Taxus brevifolia, powder	25691-1	1mg
	25691-5	5 mg
	25691-25	25 mg

MW 853.91 mp 213° C (dec.)



Paclitaxel is a drug used to treat breast cancer and ovarian cancer. It is also being studied in the treatment of other types of cancer Polysciences offers Paclitaxel extracted from the bark of the Pacific yew tree Taxus brevifolia for research purposes only. In addition, Le Broc-Ryckewaert, et al are developing paclitaxel-loaded PLGA nanoparticles in an attempt to minimize the negative side effects of paclitaxel by controlled release from PLGA particles[2]. Appearance: White powder

1. "A Polymer-Based, Paclitaxel-Eluting Stent in Patients with Coronary Artery Disease", Gregg W. Stone, et al; N Engl J Med 2004; 350:221-231; January 15, 2004; and Gregg W. Stone, et al, J Am Coll Cardiol Intv. 2013;6(12):1263-1266. 2. "Development of innovative paclitaxel-loaded small PLGA nanoparticles: study of their antiproliferative activity and their molecular interactions on prostatic cancer cells" Le Broc-Ryckewaert, et al; Int J Pharm. 2013 Oct 1;454(2):712-9)

1, 10-Phenathroline [66-71-7] *HV5g*	24137-25	25 g

MW 198.22 mp 114 – 117° $C_{12}H_8N_2H_2O$

Used for the determination of Fe, Pd, V and detection of Fe, & V.

Prionex® *A2m*	24621-100	100 ml

Prionex® is a polypeptide fraction of highly purified dermal collagen of porcine origin with excellent protein stabilizing properties. Prionex® is prepared by partial hydrolysis under mild conditions. An extremely pure form of gelatine type A free from cartilage, bone and plasma components. Due to the chemical nature and the standardized quality, Prionex® can be used as an inert protein stabilizer in any kind of application and as an additive for cell culture media. No risk of BSE, MCD and HIV infective agents. Prionex® solution 10% is a clear yellow, sterile solution. pH 6.0-7.5

Gaffney PJ, Edgell TA, Dawson PA, Ford AW, Stocker K. A pig collagen peptide fraction. A unique material for maintaining biological activity during lyophilization and during storage in the liquid state. J Parm Pharmacol 1996; 48 896-8

SAR-GEL® Water Indicating Paste	24615-1	1 oz
	24615-12	12 x 1 oz tubes

Water indicating paste provides a fast, reliable way to detect water bottoms in storage tanks containing gasoline and gasoline/alcohol blends, diesel, jet fuel, fuel oil, solvents and other materials.

Benefits:

- Easy to apply – no messy jars, no need to mix, easy cleanup
- No guessing – complete color change from white to brilliant pink
- Faster reaction – immediate detection means less time wasted
- Easy to see water line – does not run
- Useful in detecting water content in laboratory recycled reagents, as well as other stain line reagents and solvents such as xylene and absolute alcohol

Sodium Thiosulfate Pentahydrate, ACS Grade [10102-17-7] *H2g*	06728-100	100 g

MW 248.18

Used to remove silver bromide crystals that remain in the photographic emulsion after latent image development.

Techniques of Autoradiography, Rodgers, 25 (1973)

TDMAC (Tridodecylmethylammonium chloride) [7173-54-8] *HK4bg*	01595-5	5 g
	01595-25	25 g

MW 572.49 mp 105 – 114° C

Used in chloride-selective solvent polymeric membrane electrodes. Also used in the production of TDMAC-heparin which is used as an antithrombogenic coating for catheters and tubing. Technical Data Sheet #172

Microchim. Acta, II, 235 (1978); Microchim. Acta, III, 1 (1984); J. Biomed. Mater. Res., 7, 145 (1973)

BioReagents

	Catalog #	Size
TDMAC-heparin (Tridodecylmethylammonium heparinate) *CH5g*		
2% (w/w) solution (~1,000 USP units/ml)	03921-50	50 ml
7% (w/w) solution (~3,500 USP units/ml)	03813-25	25 ml
Thiocarbamyl nitroblue tetrazolium chloride (TCNBT) [36889-43-7] *HU4ad*	01165-1	1 g
Trichloroacetic acid, 98% [76-03-9] *BK4d*	01241-250	250 g
XTT [111072-31-2] *HU7ad*	19661-100	100 mg
	19661-500	500 mg

TDMAC-heparin (Tridodecylmethylammonium heparinate) *CH5g*
Proven to be an effective antithrombogenic coating when applied to a variety of materials used to make catheters and tubing. For most materials a simple immersion of the device to be coated, air drying and sterilization are sufficient to provide an antithrombogenic surface that will resist clot formation. Technical Data Sheet #172
Trans. Am. Soc. Artif. Int. Organs, 15, 1 (1969); 18, 312 (1972); Am. Thor. Surg., 14, 219 (1972); J. Biomed. Mater. Res., 7, 145 (1973)

Thiocarbamyl nitroblue tetrazolium chloride (TCNBT) [36889-43-7] *HU4ad*
MW 935.93 mp 192° (dec.)
Useful for assay of dehydrogenases.
J. Histochem. Cytochem., 15, 1 (1967)

Trichloroacetic acid, 98% [76-03-9] *BK4d*
Protein precipitant and fixative. Used in fixing solutions for PAGE and IEF gels.

XTT [111072-31-2] *HU7ad*
(Tetraxolium XTT; Sodium 3'-[1-phenylamino-carbonyl]-3,4-tetrazolium]-bis[4-methoxy-6-nitro]benzenesulfonic acid hydrate) MW 673.5
Useful in in vitro cell growth assays with possible applicability to a variety of problems in cellular pharmacology and biology. An improved colorimetric assay for cell proliferation and viability utilizing XTT has been reported. An XTT-based colorimetric cellular cytotoxicity assay for melanoma and other tumor cells has also been reported. Technical Data Sheet #486
Cancer Res., 48, 4827 (1988); J. Immunol. Methods, 142, 257 (1991); 147, 153 (1992)

Buffers

	Catalog #	Size
0.5M Acetate Buffer, pH 4.6±0.2, 10X Concentrate *A2d*	24075-500	500 ml
	24075-1	1 liter
0.5M Borate Buffer, pH 8.5±0.2, 5X Concentrate *A2d*	24092-500	500 ml
	24092-1	1 liter
Cacodylic acid, free acid [75-60-5] *KP7bg*	03880-100	100 g
Cacodylic acid, sodium salt trihydrate [6131-99-3] *MV7g*	01131-25	25 g
	01131-100	100 g
	01131-500	500 g

0.5M Acetate Buffer, pH 4.6±0.2, 10X Concentrate *A2d*
Dilute 1–>10 with deionized water to get buffer at working concentration.
Technical Data Sheet #526

0.5M Borate Buffer, pH 8.5±0.2, 5X Concentrate *A2d*
Dilute 1–>5 with deionized water to get buffer at working concentration.
Suitable for use in protocols for coupling proteins to polystyrene microspheres. Technical Data Sheet #526

Cacodylic acid, free acid [75-60-5] *KP7bg*
(Dimethylarsinic acid) MW 138.0 mp 198 – 200° C $C_2H_7AsO_2$
Cacodylic acid, free acid. Requires Poison Pack

Cacodylic acid, sodium salt trihydrate [6131-99-3] *MV7g*
(Sodium cacodylate) MW 214.03
Dissolve in distilled or deionized water heated to 60° C, under a hood. Requires Poison Pack

BioReagents

	Catalog #	Size
Cacodylic acid, sodium salt, solution, 0.2M, pH 7.4 *H4d* . . . . . Buffer for fixatives for light and electron microscopy; e.g., osmium tetroxide, formaldehyde, glutaraldehyde, Karnovsky's fixative.	18661-100 18661-500	100 ml 500 ml
0.5M Citrate-Citric Acid Buffer, pH 4.6±0.2, 10X Concentrate *A2d* . . . . . Dilute 1–>10 with deionized water to get buffer at working concentration. Technical Data Sheet #526	24076-500 24076-1	500 ml 1 liter
0.05M Citrate-Citric Acid Buffer, pH 4.6±0.2, 1X Powdered Blend *H4g* . . . . . Dissolve the contents of each pouch in a liter of deionized water. Technical Data Sheet #526	24077-5 24077-10	5 pouches 10 pouches
Tris-Acetate-EDTA Buffer (TAE Buffer), pH 8.3±0.2, 10X Concentrate *A2d* . . . . . Dilute 1–>10 with deionized water to get buffer at working concentration. Suitable for use in gel electrophoresis for nucleic acid analysis. Technical Data Sheet #526 *J. Sambrook et al.*	24084-1 24084-4	1 liter 4 x 1 liter
1M Tris Base [77-86-1] *H5g* (Tris[hydroxymethyl]aminomethane) MW 121.14 mp 169 – 173° Ultra Pure Tris base, recrystallized is the buffer of choice for a variety of biochemical applications. Tris displays optimum performance in the pH range of 7 – 9, the range in which many enzymes exhibit maximum activity. It is used in enzyme purification and assay protocols. It is alos widely used as a buffer for enzyme digestion of DNA, and is ideally suited for use as an electrophoresis buffer for bothe agarose and polyacrylamide gels used to analyze DNA fragments, RNA and proteins. Purity: 99.9% Technical Data Sheet #502 *Anal. Chem., 37, 1291 (1965)*		
pH 10.7±0.2	24098-500 24098-1	500 ml 1 liter
pH 4.1±0.2	24099-500 24099-1	500 ml 1 liter
1mM EDTA Buffer for Antigen Retrieval, pH 8.0 *A2d & A3d* . . . . . 1mM EDTA buffer for use on formalin-fixed, paraffin-embedded tissue sections for target retrieval prior to immunohistochemistry (IHC) procedures. Technical Data Sheet #894	25080-1	1 kit
Tris-Borate-EDTA Buffer (TBE Buffer) pH 8.3±0.2, 1X Powdered Blend *H4g* . . . . . Dissolve the contents of each pouch in a liter of deionized water to get 0.089M Tris/Borate, 0.002M Disodium EDTA. Technical Data Sheet #526	24087-5 24087-10	5 pouches 10 pouches
Tris-Borate-EDTA Buffer (TBE Buffer), pH 8.3±0.2, 10X Concentrate *A2d* . . . . . Dilute 1–>10 with deionized water to get buffer at working concentration. Suitable for use in gel electrophoresis for nucleic acid anaylsis. Technical Data Sheet #526 *J. Sambrook et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory (1989), p. 6.7, B.23.*	24086-500 24086-1	500 ml 1 liter
Tris-Glycine Buffer (TG Buffer), pH 8.3±0.2, 10X Concentrate *A2d* . . . . . Suitable for use in Polyacrylamide gel electrophoresis and Western blotting. Dilute 1–>10 with deionized water to get buffer at working concentration. Technical Data Sheet #526 *H.Towbin et al. Proc. Nat. Acad. Sci. USA, 75: 4350 (1979)*	24088-500 24088-1	500 ml 1 liter
Tris-Glycine Buffer (TG Buffer), pH 8.3±0.2, 1X Powdered Blend *H4g* . . . . . Dissolve the contents of each pouch in a liter of deionized water to get 0.025M Tris base, 0.192M Glycine.	24089-5 24089-10	5 pouches 10 pouches

BioReagents

	Catalog #	Size
1M Glycine-HCl Buffer, pH 2.7±0.1, 10X Concentrate *A2d*	24074-500	500 ml
	24074-1	1 liter
Phosphate Buffered Saline (PBS), pH 7.4±0.2, 1X Powdered Blend *H4g*	24081-5	5 pouches
	24081-10	10 pouches
0.05M Phosphate-Citrate Buffer, pH 5.0±0.2, 1X Powdered Blend *H4g*	24079-5	5 pouches
	24079-10	10 pouches
PolyTransport Buffer *A2g*	24311-250	250 ml
	24311-500	500 ml
Tris-Glycine-SDS Buffer (TGS Buffer), pH 8.3±0.2, 10X Concentrate *A2d*	24090-500	500 ml
	24090-1	1 liter
0.1M Sodium Bicarbonate-Sodium Carbonate Buffer, pH 9.6±0.2, 1X Powdered Blend *H4g*	24094-5	5 pouches
	24094-10	10 pouches
1M Sodium Bicarbonate-Sodium Carbonate Buffer, pH 9.6±0.2, 10X Concentrate *A2d*	24095-500	500 ml
	24095-1	1 liter
	24095-4	4 x 1 liters
Sodium Phosphate Storage Buffer *A2d*	24171-20	20 ml
StainRITE® May-Grünwald Giemsa Phosphate Buffer pH 7.2	25032-1	1 liter
	25032-4	4 liters

1M Glycine-HCl Buffer, pH 2.7±0.1, 10X Concentrate *A2d*
Dilute 1-> 10 with deionized water to get buffer at working pH 2.7. Concentration of solution after dilution is 0.1 M. Technical Data Sheet #526

Phosphate Buffered Saline (PBS), pH 7.4±0.2, 1X Powdered Blend *H4g*
Dissolve the contents of each pouch in a liter of deionized water to get 0.01M, Sodium phosphate, 0.15M Sodium chloride.

0.05M Phosphate-Citrate Buffer, pH 5.0±0.2, 1X Powdered Blend *H4g*
Dissolve the contents of each pouch in a liter of deionized water. Technical Data Sheet #526

PolyTransport Buffer *A2g*
Used to transport and preserve specimens from surgery to the point of grossing and fixation prior to further processing. Prevents proteins from denaturing or crosslinking and prevents bacterial growth. Also contains a cryoprotectant to prevent ice crystal formation during rapid freezing techniques and a membrane stabilizer to prevent membrane lysis. No washing of specimens necessary prior to placing in fixative or rapid freezing. Technical Data Sheet #631

Tris-Glycine-SDS Buffer (TGS Buffer), pH 8.3±0.2, 10X Concentrate *A2d*
Dilute 1–>10 with deionized water to get buffer at working concentration. Suitable for use in SDS-Polyacrylamide gel electrophoresis. Technical Data Sheet #526
U.K. Laemmli., Nature, 227: 680 (1970).

0.1M Sodium Bicarbonate-Sodium Carbonate Buffer, pH 9.6±0.2, 1X Powdered Blend *H4g*
Dissolve the contents of each pouch in a liter of deionized water.
Technical Data Sheet #526

1M Sodium Bicarbonate-Sodium Carbonate Buffer, pH 9.6±0.2, 10X Concentrate *A2d*
Dilute 1–>10 with deionized water to get buffer at working concentration. Suitable for use in protocols for covalent coupling of proteins to carboxylate microspheres. Technical Data Sheet #526

Sodium Phosphate Storage Buffer *A2d*
0.02M PBS with biocide (0.1% sodium azide), blocking protein BSA, and glycerol. For the storage of protein bound microspheres.

StainRITE® May-Grünwald Giemsa Phosphate Buffer pH 7.2
For use as a buffer in May-Grünwald, Wright Stain, Wright-Giemsa, Giemsa and Leishman staining procedures.

BioReagents

	Catalog #	Size
StainRITE® Wright-Giemsa Stain Phosphate Buffer pH 6.8 . . . . . Yields satisfactory staining results every time when used with Wright-Giemsa stains. The buffer used in the Wright-Giemsa staining protocol needs to be pH 6.8 or results will be unsatisfactory. If the buffer is too acidic the stain will be too red and nuclei will be too light; if it is too basic the stain will be too blue and cytoplasmic detail will be indistinct. *For quantities of StainRITE® stains exceeding 200 liters, please call for a bulk quote!* Technical Data Sheet #815	24984-1 24984-4	1 liter 4 liters
StainRITE® Wright Stain Phosphate Buffer pH 6.8 . . . . . Yields satisfactory staining results every time when used with the Wright staining method. The buffer used in the Wright staining protocol needs to be pH 6.8 or results will be unsatisfactory. If the buffer is too acidic the stain will be too red and nuclei will be too light; if it is too basic the stain will be too blue and cytoplasmic detail will be indistinct.	24989-1 24989-4	1 liter 4 liters
Tris base, Chemzymes Ultra Pure™ [77-86-1] *H5g* . . . . . (Tris[hydroxymethyl]aminomethane) MW 121.14 mp 169 – 173° Ultra Pure Tris base, recrystallized is the buffer of choice for a variety of biochemical applications. Tris displays optimum performance in the pH range of 7 - 9, the range in which many enzymes exhibit maximum activity. It is used in enzyme purification and assay protocols. It is also widely used as a buffer for enzyme digestion of DNA, and is ideally suited for use as an electrophoresis buffer for both agarose and polyacrylamide gels used to analyze DNA fragments, RNA and proteins. Purity: 99.9% Technical Data Sheet #502 *Anal. Chem., 37, 1291 (1965)*	23483-100 23483-250 23483-500	100 g 250 g 500 g
Tris Buffered Saline (TBS), pH 8.0±0.2, 10X Concentrate *A2d* . . . . . Dilute 1–>10 with deionized water to get buffer at working concentration.	24082-500 24082-1	500 ml 1 liter
Tris Buffered Saline (TBS), pH 8.0±0.2, 1X Powdered Blend *H4g* . . . . . Dissolve the contents of each pouch in a liter of deionized water to get 0.05M Tris-HCl, 0.15M Sodium chloride. Technical Data Sheet #526	24083-5 24083-10	5 pouches 10 pouches
Tris·HCl, Chemzymes Ultra Pure™ [1185-53-1] *HK3g* . . . . . (Tris[hydroxymethyl]aminomethane hydrochloride) MW 157.64 An alternative to Tris base in the preparation of Tris buffers. Purity: 99% *Contact for Contract Manufacturing buffer solutions.* Technical Data Sheet #503	23484-100 23484-250 23484-500	100 g 250 g 500 g

Heparan sulfate/heparin oligosaccharides

Homogeneous heparan sulfate/heparin oligosacchardies are difficult to obtain from natural sources or through chemical synthesis. Using a chemoenzymatic method invented by Dr. Jian Liu at the University of North Carolina[1], a range of oligosaccharides have been synthesized. Heparan sulfate/heparin play essential roles in many biological processes, including blood coagulation, viral/bacterial infections tumor growth and embryonic development[2]. These heparan sulfate/heparin oligosaccharides are used to probe the structural selectivity in heparan sulfate-mediated biological functions. Polysciences' heparan sulfate/heparin oligosaccharides are research reagents for cell biology, cancer, vascular biology, developmental biology, drug delivery, virology, glycomics/proteomics and pharmacology.

(1)(a) Xu, Y.; Masuko, S.; Takieddin, M.; Xu, H.; Liu, R.; Jing, J.; Mousa, S. A.; Linhardt , R. J.; Liu, J. Science 2011, 334, 498(b) Xu, Y.; Cai, C.; Chandarajoti, K.; Hsieh, P.; Lin, Y.; Pham, T. Q.; Sparkenbaugh, E. M.; Sheng, J.; Key, N. S.; Pawlinski, R. L.; Harris, E. N.; Linhardt , R. J.; Liu, J. Nat Chem Biol 2014, 10, 248. (2)(a) Linhardt , R. J.; Liu, J. Curr Opin Pharmacol 2012, 12, 217(b) Shukla, D.; Spear, P. G. J. Clin. Invest. 2001, 108, 503(c) Bishop, J.; Schuksz, M.; Esko, J. D. Nature 2007, 446, 1030(d) Fuster, M. M.; Wang, L.; Castagnola, J.; Sikora, L.; Reddi, K.; Lee, P. H. A.; Radek, K. A.; Schuksz, M.; Bishop, J. R.; Gallo, R. L.; Sriramarao, P.; Esko, J. D. J. Cell Biol. 2007, 177, 539.

New! Heparan Oligosaccharide NA-4Mer *U4f* . . . . . MW 897.75 $C_{34}H_{47}N_3O_{25}$ A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-4Mer is a tetrasaccharide with a UV chromophore that carries a p-nitrophenyl group. **Composition**: GlcNAc-GlcA-GlcNAc-GlcA-pNP Store below -20° C Appearance: white to yellow powder	25738-1000	1000 µg

BioReagents

	Catalog #	Size
New! Heparan Oligosaccharide NA-5Mer *U4f* MW 1,073.87 $C_{40}H_{55}N_3O_{31}$ Composition: GlcA-GlcNAc-GlcA-GlcNAc-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-5Mer is a pentasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25739-1000	1000 µg
New! Heparan Oligosaccharide NA-6Mer *U4f* MW 1,277.06 $C_{48}H_{68}N_4O_{36}$ Composition: GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-6Mer is a hexasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25740-1000	1000 µg
New! Heparan Oligosaccharide NA-7Mer *U4f* MW 1,453.19 $C_{54}H_{76}N_4O_{42}$ Composition: GlcA-GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-7Mer is a heptasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25741-1000	1000 µg
New! Heparan Oligosaccharide NA-8Mer *U4f* MW 1,656.38 $C_{62}H_{89}N_5O_{47}$ Composition: GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-8Mer is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25742-1000	1000 µg
New! Heparan Oligosaccharide NA-9Mer *U4f* MW 1,832.51 $C_{68}H_{97}N_5O_{53}$ Composition: GlcA-GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-GlcNAc-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-9Mer is a nonasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25743-1000	1000 µg
New! Heparan Oligosaccharide NS-4Mer *U4f* MW 973.79 $C_{30}H_{43}N_3O_{29}$ Composition: GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-4Mer is a tetrasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25744-1000	1000 µg
New! Heparan Oligosaccharide NS-5Mer *U4f* MW 1,149.91 $C_{36}H_{51}N_3O_{35}S_2$ Composition: GlcA-GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-5Mer is a pentasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25745-1000	1000 µg
New! Heparan Oligosaccharide NS-6Mer *U4f* MW 1,391.12 $C_{42}H_{62}N_4O_{42}S_3$ Composition: GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-6Mer is a hexaasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25746-1000	1000 µg
New! Heparan Oligosaccharide NS-7Mer *Uf4* MW 1,567.25 $C_{48}H_{70}N_4O_{48S3}$ Composition: GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-7Mer is a heptaasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25747-1000	1000 µg
New! Heparan Oligosaccharide NS-8Mer *U4f* MW 1,808.46 $C_{54}H_{81}N_5O_{55}S_4$ Composition: GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-8Mer is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25748-1000	1000 µg

BioReagents

	Catalog #	Size
New! Heparan Oligosaccharide NS-9Mer *U4f* MW 1,984.59 $C_{60}H_{89}N_5O_{61}S_4$ Composition: GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-9Mer is a nonaasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25749-1000	1000 µg
New! Heparan Oligosaccharide NS-9Mer Mono6S *U4f* MW 2,064.64 $C_{60}H_{89}N_5O_{64}S_5$ Composition: GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-9Mer Mono6S is a nonasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25750-500	500 µg
New! Heparan Oligosaccharide NS-9Mer Di6S *U4f* MW 2,144.7 $C_{60}H_{89}N_5)_{67}S_6$ Composition: GlcA-GlcNS-GlcA-GlcNS-GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-9Mer Di6S is a nonasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25751-500	500 µg
New! Heparan Oligosaccharide NS-9Mer Tri6S *U4f* MW 2,224.76 $C_{60}H_{89}N_5O_{70}S_7$ Composition: GlcA-GlcNS-GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-9Mer Tri6S is a nonasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25752-500	500 µg
New! Heparan Oligosaccharide NS-9Mer Tetra6S *U4f* MW 2,304.81 $C_{60}H_{89}N_5O_{71}S_8$ Composition: GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-9Mer Tetra6S is a nonasaccharide with a UV chromophore that carries a p-nitrophenyl group.Store below -20° C Appearance: white to yellow powder	25753-500	500 µg
New! Heparan Oligosaccharide NS-8Mer Mono2S *U4f* MW 1,888.52 $C_{54}H_{81}N_5O_{58}S_5$ Composition: GlcNS-GlcA-GlcNS-GlcA-GlcNS-IdoA2S-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-8Mer Mono2S is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25754-250	250 µg
New! Heparan Oligosaccharide NS-8Mer Di2S *U4f* MW 1,968.58 $C_{54}H_{81}N_5O_{61}S_6$ Composition: GlcNS-GlcA-GlcNS-IdoA2S-GlcNS-IdoA2S-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS-8Mer Di2S is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25755-250	250 µg
New! Heparan Oligosaccharide NA-8Mer Di2S *U4f* MW 1,930.56 $C_{56}H_{83}N_5O_{59}S_5$ Composition: GlcNAc-GlcA-GlcNS-IdoA2S-GlcNS-IdoA2S-GlcNS-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA-8Mer Di2S is a octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25756-250	250 µg
New! Heparan Oligosaccharide NS6S-8Mer Mono2S *U4f* MW 2,208.75 $C_{54}H_{81}N_5O_{70}S_9$ Composition: GlcNS6S-GlcA-GlcNS6S-GlcA-GlcNS6S-IdoA2S-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS6S-8Mer Mono2S is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder	25757-250	250 µg

BioReagents

	Catalog #	Size
New! Heparan Oligosaccharide NS6S-8Mer Di2S *U4f*	25758-100	100 µg
MW 2,288.80 $C_{54}H_{81}N_5O_{73}S_{10}$ Composition: GlcNS6S-GlcA-GlcNS6S-IdoA2S-GlcNS6S-IdoA2S-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NS6S-8Mer Di2S is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to pale yellow		
New! Heparan Oligosaccharide NA6S-8Mer Di2S *U4f*	25759-100	100 µg
MW 2,250.78 $C_{56}H_{83}N_5O_{71}S_9$ Composition: GlcNAc6S-GlcA-GlcNS6S-IdoA2S-GlcNS6S-IdoA2S-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. NA6S-8Mer Di2S is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group.Store below -20° C Appearance: white to yellow powder		
New! Heparan Oligosaccharide 3S-6Mer *U4f*	25760-100	100 µg
MW 1,791.41 $C_{42}H_{62}N_4O_{57}S_8$ Composition: GlcNS6S-GlcA-GlcNS3S6S-IdoA2S-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. 3S-6Mer is a hexasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder		
New! Heparan Oligosaccharide 3SNA-8Mer *U4f*	25761-100	100 µg
MW 2,330.84 $C_{56}H_{83}N_5O_{74}S_{10}$ Composition: GlcNAc6S-GlcA-GlcNS3S6S-IdoA2S-GlcNS6S-IdoA2S-GlcNS6S-GlcA-pNP A low molecular weight synthetic heparan oligosaccharide made by enzymatic synthesis. 3SNA-8Mer is an octasaccharide with a UV chromophore that carries a p-nitrophenyl group. Store below -20° C Appearance: white to yellow powder		

Cell Biology

New! Duramycin-LC-Biotin	25690-100	100 µg
MW 2,352 Appearance: Colorless Solid Biotin is attached to amino groups of duramycin via a 6-carbon aminohexanoyl spacer. The conjugate contains 1 biotin molecule per duramycin molecule. Duramycin binds phosphatidylethanolamine (PE) at a 1:1 ratio with high affinity (Kd of 4-6 nM) and exclusive specificity. Technical Data Sheet #1017		
FastFix *CHM7g*	24607-100	100 ml
One-step rapid fixative for frozen sectioned tissue. Fixes tissue to slide to allow for staining procedures. Technical Data Sheet #834	24607-500	500 ml
New! Transporter™ 5 Transfection Reagent *A4d*	26008-1	1 ml
Appearance: liquid Transporter™ 5 Transfection Reagent is a ready-to-use transfection reagent based on a proprietary polyethylenimine derivative. The novel chemical structure of Transporter™ 5 enables the reagent to condense DNA into positively charged particles which enter the cell by endocytosis. Transporter™ 5 works exceptionally well for transfection of HEK-293, CHO, COS, HeLa, insect cell lines (Sf9 and Sf21) and a variety of other eukaryotic cell lines. *Rajendra, Y., Kiseljak, D., Baldi, L., Wurm, F. M. and Hacker, D. L. (2015), Transcriptional and post-transcriptional limitations of high-yielding, PEI-mediated transient transfection with CHO and HEK-293E cells. Biotechnol Progress, 31: 541–549. doi: 10.1002/btpr.2064, Backliwal, G., Hildinger, M., Hasija, V. and Wurm, F. M. (2008), High-density transfection with HEK-293 cells allows doubling of transient titers and removes need for a priori DNA complex formation with PEI. Biotechnol. Bioeng., 99: 721–727. doi: 10.1002/bit.21596, Choosakoonkriang, S., Lobo, B. A., Koe, G. S., Koe, J. G. and Middaugh, C. R. (2003), Biophysical characterization of PEI/DNA complexes. J. Pharm. Sci., 92: 1710–1722. doi: 10.1002/jps.10437, Expired U.S. Patent No. 6,013,240; Nucleic Acid Containing Composition, Preparation, and Uses of the Same*	26008-5	5 ml

Cell Biology

Bovine Serum Albumin (BSA)

Polysciences' BSA is produced in a "closed-loop" system that ensures that the total manufacturing process, from raw material collection to finished product packaging, results in a highly purified product that is virtually contaminant free and:

- Contains no detectable IgG, endotoxin, enzyme or protease activity, ensuring assay integrity, component stability and cell culture suitability
- Is traceable to source animals, easing regulatory approval
- Possesses superior solubility/filterability characteristics
- Is manufactured from plasma produced at domestic, USDA inspected abattoirs
- Is produced in accordance with FDA bulk pharmaceutical cGMPs
- Is validated for clearance of TSE agents
- Lyophilized BSA is available in quantities up to 10 kilograms, or in custom aqueous formulations per your specifications. Material originating from Australia/New Zealand is also available upon request.

	Catalog #	Size
Standard Grade, pH 7.0, >96% Purity, Lyophilized	25637-10	10 g
	25637-50	50 g
	25637-100	100 g
	25637-1	1 kg
Standard Grade, pH 5.2, >96% Purity, Lyophilized	25638-10	10 g
	25638-50	50 g
	25638-100	100 g
	25638-1	1 kg
Reagent Grade, pH 7.0, >98% Purity, Lyophilized	25639-10	10 g
	25639-50	50 g
	25639-100	100 g
	25639-1	1 kg
Cohn Analog (Microbiological), Lyophilized	25640-10	10 g
	25640-50	50 g
	25640-100	100 g
	25640-1	1 kg
Ultratech (Biotechnological), Lyophilized	25641-10	10 g
	25641-50	50 g
	25641-100	100 g
	25641-1	1 kg
New Zealand Sourced Standard Grade, Lyophilized	25642-10	10 g
	25642-50	50 g
	25642-100	100 g
	25642-1	1 kg
Standard Grade, 30% Solution (aq) w/ Azide	25643-100	100 mL
	25643-500	500 mL
	25643-1	1 L
Standard Grade, 30% Solution (aq), No Preservative	25644-100	100 mL
	25644-500	500 mL
	25644-1	1 L
Reagent Grade, 35% Solution (aq) w/ Azide	25645-100	100 mL
	25645-500	500 mL
	25645-1	1 L
Reagent Grade, 35% Solution (aq), No Preservative	25646-100	100 mL
	25646-500	500 mL
Reagent Grade, 35% Solution (aq), No Preservative	25646-1	1 L
Cell Culture Grade, 35% Solution (aq) w/ Azide	25647-50	50 mL
	25647-100	100 mL
Cell Culture Grade, 35% Solution (aq), No Preservative	25648-50	50 mL
	25648-100	100 mL

Cell Biology

Catalog #	Size

Cell Culture

XTT [111072-31-2] *HU7ad* . . . . . 19661-100 100 mg
19661-500 500 mg

(Tetraxolium XTT; Sodium 3'-[1-phenylamino-carbonyl]-3,4-tetrazolium]-bis[4-methoxy-6-nitro]benzenesulfonic acid hydrate) MW 673.5
Useful in in vitro cell growth assays with possible applicability to a variety of problems in cellular pharmacology and biology. An improved colorimetric assay for cell proliferation and viability utilizing XTT has been reported. An XTT-based colorimetric cellular cytotoxicity assay for melanoma and other tumor cells has also been reported. Technical Data Sheet #486
Cancer Res., 48, 4827 (1988); J. Immunol. Methods, 142, 257 (1991); 147, 153 (1992)

Cell Culture Bags

Polysciences' cell culture bags are a simple-to-use, single-use device for the culture, harvest and storage of cells. The vessel is constructed using a USP Class VI medical grade material displaying the superior gas permeability needed to support rapid cell growth, and with the robustness necessary for centrifugation.

The bags are available for purchase in several sizes (from 50 ml to 2 L) and most sizes fit into standard centrifuge adaptors and rotors, for single-step cell harvesting using standard centrifugation conditions. These cell culture bags can be used with greater fill volumes than other standard cell culture devices, while still delivering high protein yields.

No extraneous shaker or stirring devices are required with Polysciences cell culture bags, and only a simple CO_2 incubator is needed. The use of highly compact wire shelving, such as those available with the Caron Products 6024 Reach-In CO_2 Incubator provide the space and capacity for up to 96 one liter cell culture bags, converting your Caron incubator into a bioreactor-scale system. This is 3 times as much cell culture volume compared to similar incubators filled with flasks and roller bottles.

Examples of cell types cultured using Polysciences cell culture bags include: Hybridomas, CHO K-1, HEK293, Jurkats, Stem Cells (embryonic and adipose-derived), sf-9 insect, CHO-S and plant cells

50 mL Fill Volume w/ Fitment - 15 bags per box	25626-1	1 box
50 mL Fill Volume w/ 2 Ports - 15 bags per box	25627-1	1 box
250 mL Fill Volume w/ Fitment - 10 bags per box	25628-1	1 box
250 mL Fill Volume w/ Fitment & 2 Ports - 10 bags per box	24829-1	1 box
250 mL Fill Volume w/ 2 Ports - 10 bags per box	25630-1	1 box
1 L Fill Volume w/ Fitment - 5 bags per box	25631-1	1 box
1 L Fill Volume w/ Fitment & 3 Ports - 5 bags per box	25632-1	1 box
1 L Fill Volume w/ 3 Ports - 5 bags per box	25633-1	1 box
2 L Fill Volume w/ Fitment - 5 bags per box	25634-1	1 box
2 L Fill Volume w/ Fitment & 3 Ports - 5 bags per box	25635-1	1 box
2 L Fill Volume w/ 3 Ports - 5 bags per box	25636-1	1 box

Cell Separation

Nylon Wool Fiber *A2g* . . . . . 18369-10 10 g
18369-50 50 g

Nylon wool fiber can be used to separate leukocytes from peripheral blood and to separate T-cells from B-cells. Granulocytes and B-cells stick to the fibers, while T-cells and other cells do not. Technical Data Sheet #425A
Transfusion, 2, 221 (1962); Immunol. Commun., 1, 571 (1972); Eur. J. Immunol., 3, 645 (1973); J. Clin. Invest., 61(3), 697 (1978)

Cell Biology

	Catalog #	Size
Nylon Wool Fiber, Sterile *A2g* . . . . . Ready to use, 500mg prepacked in sterile 10cc syringes. Technical Data Sheet #425A	21759-1	10 syringes

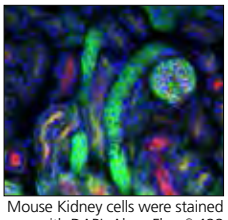
Cytology Dyes & Stains

Indocyanine green [3599-32-4] *HK3g* . . . . . (Cardiogreen; Fox green) MW 774.99 Dye for hemodynamic studies. Technical Data Sheet #1018 *Invest. Ophthalmol., 13, 77 (1974)*	08263-50	50 mg
Phenol Red, ACS [143-74-8] . . . . . MW 354.38 $C_{19}H_{14}O_5S$ Phenol Red is suitable for use as a pH indicator. λ max: 360nm, 557nm (2nd) *Merck 13, 7329, Beilstein 19, V, 3, 457*	25003-25	25 g
Acridine Orange, C.I. 46005, very high purity [65-61-2] *HU5e* . . . . . (3,6-Bis[dimethylamino]acridine hydrochloride hydrate) MW 301.83 DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Free of inorganic salts. A specific stain for RNA, used as a 2% solution containing 1% lanthanum acetate in 15% acetic acid. λ max 494 ± 4nm *J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001); J. Lab Med., 15(3), 180 (1984)*	04539-500 04539-5	500 mg 5 g
2% Acridine Orange, Ready-to-Use [65-61-2] *HU5d* . . . . . Ultrapure DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Ready-to-use and free of inorganic salts. A specific stain for RNA, used as a 2% solution. Ready-to-use format eliminates the exposure to potentially irritating powdered dyes. *J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001) J. Lab Med., 15(3), 180 (1984)*	24603-10	10 ml
Calcein, 2,4-Bis(N,N'-di[carboxymethyl]aminomethyl) fluorescein [1461-15-0] *U5f* . . (DCAF) MW 622.65 Fluorescent bone density stain. Also used for determination of serum magnesium. *Stain Technology, 62, 247, (1987)*	03321-1	1 g
Coumarin 1 [91-44-1] *A2g* . . . . . (7-Diethylamino-4-methylcoumarin; 7-Diethylamino-4-methyl-1-benzo-pyran-2-one) MW 231.3 Fluorescent dye, miscible in ethanol or neutral buffer.	24185-250	250 g
Coumarin 6, laser grade *U7g* . . . . . MW 350.44 For pulsed and CW operation in the green-blue spectral region. Tunable from 515-585nm. Absorption max (in ethanol): 458nm Optimum lasing (in ethanol): 540nm, Fluorescence max (in ethanol): 505nm	8037L-100	100 mg
Cyanoditolyl Tetrazolium Chloride (CTC) [102568-47-8] *HU6ad* . . . . . MW 311.8 mp 230° Soluble in ~100mg in 6.6cc water. Cyanoditolyl tetrazolium chloride has been used to measure the redox activity of tumor cells. It has also been employed for direct epifluorescent microscopic enumeration of respiring bacteria in food samples and environmental samples, especially water samples. Reveals a quantitative methodology for measuring marine bacteria. These methods yield 80% activity in 2 to 10 minutes. Cell samples mixed with CTC can be stored refrigerated or frozen in liquid nitrogen for at least 4 weeks without a significant loss of cells. Formazan fluoresces in solid state. Em. max: 630nm Ex. max: 450nm Technical Data Sheet #486 E. coli bacteria in CTC *Histochem. J. 19, 21 (1987); Appl. Environ. Microbiol., 58, 1801 (1992); Appl. Environ. Microbiol., 65(5), 1966 (1999); Appl. Environ. Microbiol., 69(4), 2166 (2003); Flow Cytometric Analysis: Appl. Environ. Micro. June 1999, p. 2409-2417 Vol. 65 (6)*	19292-100 19292-1	100 mg 1 g

Cell Biology

	Catalog #	Size
4',6-Diamidino-2-phenylindole dihydrochloride (DAPI) [28718-90-3] *U3acd*	09224-10	10 mg
	09224-50	50 mg

MW 350.25
A cationic fluorescent dye which specifically binds to adenine-thymine-rich DNA. Applications include detection of nanogram quantities of DNA in cellular homogenates, and cytofluorometric determination of the DNA base content in human chromosomes. *Available in bulk quantities for OEM users at significant savings.* λ max: 342nm Technical Data Sheet #444
Nature, 253, 461 (1975); Anal. Biochem., 92, 497 (1979); Stain Technol., 60, 7 (1985); Eur. J. Biochem., 182, 437 (1989)

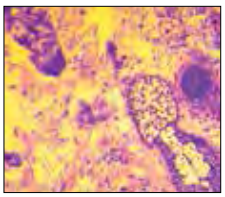

Mouse Kidney cells were stained with DAPI, Alexa Fluor® 488 wheat germ agglutinin, Alexa Fluor® 568 phalloidin. Contributed by Walt Metcalfe, Molecular Probes, Inc.; photographed by Gregg Jarvis, Omega Optical, Inc.

2',7'-Dichlorofluorescein [76-54-0] *H4g*	05134-10	10 g

MW 401.21
0.2% Solution in ethanol can be used for the detection of saturated and unsaturated lipids. λ max: 509nm

Differential Quik Stain Kit (Modified Giemsa)	24606-250	250 ml
	24606-500	500 ml

High quality, rapid turnaround staining kit that serves many purposes in the cost conscious laboratory environment. May be used for rapid blood smears for differential assessment, as well as detecting *H. pylori* microorganisms. The stain is very useful to pathologists for immediate interpretation of fine needle aspiration biopsies. Technical Data Sheet #715


Helix shaped Helicobacter Pylori bacteria in human colon tissue.

Benefits:

- Excellent cytology stain
- Clear nuclear staining of bacteria and fungus in deep shades of blue
- Save Time – Fast alternative to Wright-Giemsa staining procedures.

Diagnosis of Pneumocystis jirovecii pneumonia by bronchoalvolar lavage in AIDS patients. Comparison of Diff-Quik, fungifluor stain, direct immunofluorescence test and polymerase chain reaction; Acta Cytol, 1995 Nov-Dec, 39(6) 1089-93 2. Diff-Quik Stain as a Simplified Alternative to Papanicolaou Stain for Determination of Quality of Endocervical Specimens Submitted for PCR Detection of Chlamydia trachomatis; Journal of Clinical Microbiology, Oct 1996, p. 2590-2592ii

Filipin (from Streptomyces filipinensis) [11078-21-0] *HO6d*	08707-50	50 mg
	08707-100	100 mg

Polyene antibiotic fluorochrome for cholesterol determination. Used as an antifungal agent.
Cytometry, 8, 146 (1987)

Fluorescein diacetate [596-09-8] *A2f*	00615-5	5 g

(Diacetylfluorescein; 3,6-Diacetoxyfluoran) MW 416.39 mp 198 – 201°
Lipase substrate. Also a fluorescent substrate in studies on membrane permeability and intracellular interactions. λ max: 494nm
Anal. Chem., 36, 409 (1964); J. Biol. Chem., 258, 6380 (1983)

Fluorescein, Sodium Salt, C.I. 45350 [518-47-8]	24997-100	100 g
	24997-500	500 g

(Acid Yellow, Uraine) MW 376.27 $C_{20}H_{10}Na_2O_5$
Fluorescein sodium is used extensively as a diagnostic tool in the field of ophthalmology and optometry. Topical fluorescein is used for the diagnosis of corneal abrasions, ulcers and herpetic corneal infections.
Merck 13, 4185, Beilstein 19, IV, 2904

Gill's Hematoxylin #1 for Cytology *A2g*	24242-500	500 ml
	24242-1000	1000 ml

Gold Standard Gill's #1 is ideal for routine cytology staining. This single strength formulation optimally stains gynecological and non-gynecological specimens. Technical Data Sheet #192

Human cheek cells, Gill's #1, Gill's Modified EA & OG-6

Cell Biology

	Catalog #	Size
Gill's modified OG-6 & EA *CH5g* OG-6 is a cytoplasmic counterstain solution used in sequence with EA (EA 50, EA 65 or EA36) in the Papanicolaou staining method for clinical cytology. Gill's modified OG-6 is stable in solution and gives predictable high quality staining results not previously possible with other formulations. Technical Data Sheet #196		
Gill's modified OG-6	09782-500	500 ml
	09782-1000	1000 ml
	09782-3.75	3.75 liters
Gill's modified EA	09783-500	500 ml
	09783-1000	1000 ml
	09783-3.75	3.75 liters
Hydroethidine™ (Dihydroethidium bromide) [104821-25-2] *HU5cd* . . . . . . MW 315.5 mp 202 – 206° Reduced ethidium bromide. A vital stain. Enters and stains living cells without cellular trauma. Double staining system. Stains cytoplasm blue and chromatin red. Excellent cellular retention. Remains incorporated in chromatin with virtually no leakage. Essentially non-toxic. Shows no toxicity at levels useful for visualizing chromatin. Em. max: 420nm Ex. max: 365nm Technical Data Sheet #351 *Biotechnology, 3, 4 (1985)*	17084-50	50 mg
Lissamine Rhodamine B sulfonyl chloride, ~99% [62796-29-6] *H3g* . . . . . . MW 577.1 Fluorescent protein stain with bright orange fluorescence. Used to visualize actin filaments in living amoebas. Useful for waste water testing and various microbiological applications. *J. Cell. Biol. 86, 590 (1980)*	08074-100	100 mg
Naphthalene-2,3-dicarboxaldehyde [7149-49-7] *HY4g* . . . . . . MW 184.19 mp 131 – 133° Highly Purified Grade-single spot TLC Fluorogenic derivatizing agent for amines. Useful for fluorescent determination of serum arginine and for trace amino acid and peptide analysis.	21486-100	100 mg
PSVue® 380 . . . . . . The PSVue®380 (formerly PSS-380) reagent kit contains components to provide ~0.40 mL of a 2 mM solution of PSVue®380 in 50% aqueous ethanol solution. The compound has an absorbance max at 380nm and a fluorescence emission max at 440nm. Provides a 10X increase in fluorescence intensity upon binding to anionic membranes. Technical Data Sheet #879 Kit Contains: • Vial containing pre-weighed amount of apo-PSS380 solid dye (at least 0.5 mg) • Vial of 8.4 mM zinc nitrate solution in water (0.5 mL)	25102-1	1 kit
PSVue® 480 . . . . . . The PSVue®480 (formerly PSS-480) reagent kit contains components to provide ~0.5 mL of a 1 mM solution of PSVue®480 in 50% aqueous dimethylsulfoxide solution. The compound has an absorbance max at 480nm and an fluorescence emission max at 519 nm. Technical Data Sheet #880 Kit Contains: • Vial containing pre-weighed amount of apo-PSS480 solid dye (at least 0.5 mg) • Vial of 4.2mM zinc nitrate solution in water (0.5 mL)	25103-1	1 kit
New! PSVue® 550 . . . . . . MW 1,365 $C_{60}H_{61}N_{13}O_{17}Zn_2$ The PSVue® 550 reagent kit contains components to provide ~0.5 mL of 1 mM solution of PSVue® 550. The compound has an absorbance max at 553nm and fluorescence emission max at 615nm. Technical Data Sheet #1012	25684-1	1 kit

Cell Biology

	Catalog #	Size
New! PSVue® 643 MW 1,641.4 $C_{70}H_{80}N_{13}O_{20}S_2Zn_2Na$ The PSVue643® kit contains 0.25mL of a 1mM solution of PSVue643® in water. The compound has an absorbance max at 643nm and a fluorescence emission max at 658nm. Technical Data Sheet #1013	25685-1	1 kit
PSVue® 794 The PSVue®794 (formerly PSS-794) reagent kit contains components to provide ~0.68 mL of a 1 mM solution of PSVue794 in aqueous solution. The compound exhibits absorbance and fluorescence excitation maximum at 794nm and emission maximum at 810nm. The labeling vehicle provided with the kit (Diluent X) is designed to maximize dye solubility and is suitable for in vitro and in vivo use. Technical Data Sheet #878 Kit Contains: • Vial containing pre-weighted amount of apo-PSS794 solid dye (at least 1 mg) • Vial of diluent X (1 ml) • Vial of 4.2mM zinc nitrate solution in diluents X (1 ml)	25101-1	1 kit
New! PSVue® Biotin MW 1,191 $C_{46}H_{55}N_{13}OSZn_2$ PSVue® Biotin can be complexed with streptavidin-coated quantum dots (not provided) for *in vivo* and *in vitro* use. Procedures to formulate PSVue® biotin and prepare the PSVue® biotin-streptavidin-coated quantum dot complex are provided. Vial contains 1mg of solid. Technical Data Sheet #1011	25683-1	1 kit
Rhodamine B isothiocyanate, mixture of isomers [36877-69-7] *U5g* MW 536.1 Fluorescent marker for proteins. Also used as a counterstain in conjunction with FITC. *J. Bacteriol., 83, 1358 (1962); Arch. Biochem. Biophys., 133, 263 (1969)*	00374-250	250 mg
Scott's Bluing Reagent *A2g* A gentle formulation of "bluing" reagent for those specimens that may be affected by more harsh "bluing" agents. Our premixed and ready to use Scott's Bluing Reagent provides rapid bluing and crisp nuclear detail obtained with routine Hematoxylin and Eosin stains. For use in both Cytology and Histology.	24605-100 24605-1	32 oz 1 gal
Tetrachrome Stain, certified (MacNeal's) *H4g* Blood stain similar to Wright's stain. Also useful for staining bone sections. *Conn's Biological Stains, Williams & Wilkins, 9th ed., 1977, p 606*	02783-5	5 g
Trypan Blue, C.I. 23850 [72-57-1] *HVWX6g* (Direct blue 14; Niagara blue 3B) MW 960.83 mp >300° Trypan blue has been widely used to assess the viability of eukaryotic cells. This method is often called trypan blue exclusion. Nonviable cells will exhibit a marked concentration of this blue dye in their nuclei. Tissue culture labs will find it extremely useful for determining the health and density of cell lines. Other studies have demonstrated trypan blue as an inactivating agent for measles and herpes simplex viruses and as a teratogenic agent in rats. λ max: 607nm *J. Histochem. Cytochem., 18, 581 (1970); J. Gen. Virol., 64, 1365 (1983); Teratology, 26, 289 (1982)*	01294-100	100 g

Cell Biology

Catalog #	Size

General Reagents

Prionex® *A2m* . . . . . 24621-100 100 ml

Prionex® is a polypeptide fraction of highly purified dermal collagen of porcine origin with excellent protein stabilizing properties. Prionex® is prepared by partial hydrolysis under mild conditions. An extremely pure form of gelatine type A free from cartilage, bone and plasma components. Due to the chemical nature and the standardized quality, Prionex® can be used as an inert protein stabilizer in any kind of application and as an additive for cell culture media. No risk of BSE, MCD and HIV infective agents. Prionex® solution 10% is a clear yellow, sterile solution. pH 6.0-7.5

Gaffney PJ, Edgell TA, Dawson PA, Ford AW, Stocker K. A pig collagen peptide fraction. A unique material for maintaining biological activity during lyophilization and during storage in the liquid state. J Parm Pharmacol 1996; 48 896-8

Sodium Polyanethole Sulfonate [52993-95-0] *AH4g* . . . . . 24139-5 5 g

$[CH(C_6H_3[SO_3Na]OCH_3)CH(CH_3)\text{-}]_x$

For inhibition of blood coagulation in vitro and to stabilize collodial solutions like milk and gelatin.

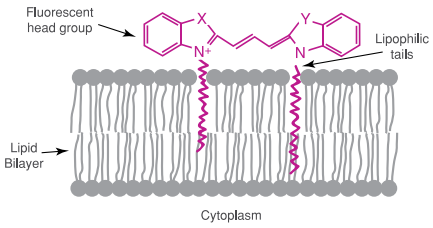
Membrane Labeling

CellVue®

CellVue® Dyes for Membrane Labeling

Sensitive probes for detecting rapid uniform membrane changes in any cell or bioparticle with a membrane. Suitable for cell tracking and proliferation studies and compatible with flow cytometers, confocal and in vivo imaging equipment. CellVue® labeled cells are brightly fluorescent, emitting in the long wavelength UV, the far red or the near infrared region of the spectrum and display potential shifts in their excitation and emission. This shift makes it possible to provide sensitive, quantitative methods for monitoring the fate of labeled cells at both macro and micro levels. Technical Data Sheet #769

Advantages:



- Versatility – use with any cell type or bioparticle with a membrane
- Provides stable labeling with minimal transfer from cell to cell
- Provides rapid, uniform membrane labeling
- Combine with fluorescent antibodies or markers of cell function
- Suitable for cell tracking and proliferation studies
- Several colors (UV to NIR) for multi-parameter studies (use with existing fluorochromes for more colors)
- Far-Red and NIR versions can provide greater signal to noise due to reduced background autofluorescence
- Compatible with flow cytometers, confocal and in-vivo imaging equipment
- Less leakage

Cell Biology

	Catalog #	Size
Burgundy – Mini Kit	24843-1	1 kit
Burgundy – MIDI Kit	24850-1	1 kit
Claret – Mini Kit	24844-1	1 kit
Claret – MIDI Kit	24849-1	1 kit
Diluent C	24902-6	6 vials
Jade – Mini Kit	24904-1	1 kit
Jade – MIDI Kit	24905-1	1 kit
Lavender – Mini Kit	24841-1	1 kit
Lavender – MIDI Kit	24851-1	1 kit
Lilac – Mini Kit	25568-1	1 kit
Maroon – Mini Kit	24840-1	1 kit
Maroon – MIDI Kit	24847-1	1 kit
NIR780 – Mini Kit	24845-1	1 kit
NIR780 – MIDI Kit	24852-1	1 kit
NIR815 – Mini Kit	24846-1	1 kit
NIR815 – MIDI Kit	24853-1	1 kit
Plum – Mini Kit	24842-1	1 kit
Plum – MIDI Kit	24848-1	1 kit
Red – Mini Kit	25567-1	1 kit
New! Red – MIDI Kit	25682-1	1 kit

Accessories

BioMasher I®

Disposable Homogenizer for soft samples with small pore size. Non-sterile, non-Autoclavable.

2.0ml Microtube with O-ring, PP filter, soft samples	25532-120	120/pk
	25532-30	30/pk
2.0ml Microtube with O-ring, PE filter, soft samples	25526-120	120/pk
	25526-30	30/pk
2.0ml Microtube w/o O-ring, PP filter, hard samples	25531-120	120/pk
	25531-30	30/pk
2.0ml Microtube w/o O-ring, PE filter, hard samples	25530-120	120/pk
	25530-30	30/pk
1.5ml Microtube with O-ring, PP filter, soft samples	25529-120	120/pk
	25529-30	30/pk
1.5ml Microtube with O-ring, PE filter, soft samples	25525-120	120/pk
	25525-30	30/pk
1.5ml Microtube w/o O-ring, PP filter, hard samples	25528-120	120/pk
	25528-30	30/pk
1.5ml Microtube w/o O-ring, PE filter, hard samples	25527-120	120/pk
	25527-30	30/pk

Cell Biology

	Catalog #	Size
Biomasher II® Disposable closed system micro tissue homogenizer. The abrasive surfaces on the pestle tip and inner tube area ensure efficient grinding of samples. Ideal for homogenizing animal tissues and organs as well as plant materials, insects, DNA, RNA, proteins, yeasts and enzymes. Tube is clear polypropylene and the pestle is polyacetal. 1.5ml Microtube.		
Non-sterile	25534-100	pk/100
EOG-sterilized	25533-100	pk/100
BioMasher III® Disposable closed system micro tissue homogenizer. The abrasive surfaces on the pestle tip and inner tube area ensure efficient grinding of samples. Ideal for homogenizing animal tissues and organs as well as plant materials, insects, DNA, RNA, proteins, yeasts and enzymes. Tube is clear polypropylene and the pestle is polyacetal. 2.0ml Microtube, Non-sterile.	25535-50	pk/50
BioMasher IV® Specifically designed to smash small organelles, yeast or bacteria. Used to collect only the content inside the organelle or yeast/bacteria without contaminating the prep with a large portion of membrane components. The mechanical motion of the beads and the sample will lyse the membrane and release the inner content into the environment. Once the contents are released into buffer, the tube can be centrifuged to collected the cleared supernatant for further molecular analyses.		
Non-sterile	25537-240	pk/240
EOG-sterile	25536-240	pk/240
Disposable Hemocytometers		
Thoma, 100 Test C-Chip	25521-1	50/pk
Thoma New, 100 Test C-Chip	25522-1	50/pk
Semen Test, 100 Test C-Chip	25517-1	50/pk
No Grid For CASA, 100 Test C-Chip	25516-1	50/pk
Neubauer, 100 Test C-Chip	25515-1	50/pk
Neubauer Improved, 100 Test C-Chip	25514-1	50/pk
Melassez, 100 Test C-Chip	25523-1	50/pk
Fuchs Rosenthal, 100 Test C-Chip	25520-1	50/pk
Burker, 100 Test C-Chip	25518-1	50/pk
Burker Turk, 100 Test C-Chip	25519-1	50/pk

Cell Biology

Catalog #	Size

SputEm™ Collection System . . . . . .

The ideal way to collect, carry and process biological samples. The unit features a base which incorporates a removable sterile 50 ml graduated polypropylene conical tube that can withstand centrifugation up to 5000 RPM or 3000g. Three narrow vertical windows allow the contents of the tube to be discreetly seen. A wide base ensures great stability and prevents tipping of the unit. The large collection funnel is made in such a way that specimens fall directly into the graduated centrifuge tube and do not contaminate the outside threads. The snap cap on top of the funnel keeps the centrifuge tub screw cap sterile.

	25491-1	1 case

StainTray™ Slide Staining System

A user friendly approach to immunohisto-chemistry staining. This tray is also suitable not only for routine staining requiring a humid chamber, but also ideal for Hematology, Cytology and Microbiology laboratories. Manipulation is made safe and easy by using only one hand.

Black base made of tough ABS plastic withstanding a wide range of chemicals (Avoid chlorinated hydrocarbons). Accepts 10 or 20 slides on four plastic rails covered with a polymer strip to perfectly hold slides even if tray is held at an angle. When humidity is needed, wells between rails will hold up to one ml of water securely without splashing. Middle wells will hold up to 2 ml each. Rails are raised not only to avoid water touching the slides but to make them more easily retrievable. Base will also hold excess stain solution dripping from the slides. Four rubber feet ensure greater base stability. Units are stackable for space saving purposes.

Two cover styles are available:

- Clear, allowing for visual examination. Made of PETG with a temperature range of -20° C – 60° C
- Black, for fluorescent work. Made of ABS with a temperature range of -80° C – 80° C

Dimensions with cover:

- 10 Slide – 24 x 24 x 4.5 cm H (9 3/8 x 9 3/8 x 1 3/4 in. H)
- 20 Slide – 38 x 24 x 4.5 cm H. (15 x 9 3/8 x 1 3/4 in. H)

Lid (10 Slide Capacity) – Black	25500-1	1 unit
Base (10 Slide Capacity) – Black	25498-1	1 unit
Lid (10 Slide Capacity) – Clear	25499-1	1 unit
Base (10 Slide Capacity) – Clear	25497-1	1 unit
Lid (20 Slide Capacity) – Black	25504-1	1 unit
Base (20 Slide Capacity) – Black	25502-1	1 unit
Lid (20 Slide Capacity) – Clear	25503-1	1 unit
Base (20 Slide Capacity) – Clear	25501-1	1 unit

Fixatives

Flow Fix Fixative Kits *A2d*

A sodium azide free buffer comprised of a neutral pH-buffered saline (i.e., Dulbecco's Phosphate-Buffered Saline). Sodium Azide –Free. Do not add sodium azide to buffers if you are concerned with recovering cell function. Technical Data Sheet #810 & 863

Kit Contains:

- 25037A – .2M phosphate buffer 250 mL, 25037B – fixative solution 250 mL & 500 mL bottle

Lanier LL, Warner NL. Paraformaldehyde Fixation of Hematopoietic Cells for Quantitative Flow Cytometry (FACS) Analysis. J Immunol Meth. 1981;47:25

1% w/v paraformaldehyde	25037-1	1 kit
2% w/v paraformaldehyde	25085-1	1 kit

Hematology

	Catalog #	Size
Methanol Fixative for Hematology	25092-500	500 ml

For use as a fixative prior to staining bloody specimen material or blood culture supernatant fluid. Methanol preserves the morphology of red blood cells as well as bacteria and parasites.

Staining

Acridine Orange, C.I. 46005, very high purity [65-61-2] *HU5e*	04539-500	500 mg
	04539-5	5 g

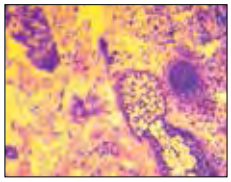
(3,6-Bis[dimethylamino]acridine hydrochloride hydrate) MW 301.83
DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Free of inorganic salts. A specific stain for RNA, used as a 2% solution containing 1% lanthanum acetate in 15% acetic acid. λ max 494 ± 4nm
J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001); J. Lab Med., 15(3), 180 (1984)

2% Acridine Orange, Ready-to-Use [65-61-2] *HU5d*	24603-10	10 ml

Ultrapure DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Ready-to-use and free of inorganic salts. A specific stain for RNA, used as a 2% solution. Ready-to-use format eliminates the exposure to potentially irritating powdered dyes.
J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001) J. Lab Med., 15(3), 180 (1984)

Differential Quik Stain Kit (Modified Giemsa)	24606-250	250 ml
	24606-500	500 ml
	24606-1	1 gal

High quality, rapid turnaround staining kit that serves many purposes in the cost conscious laboratory environment. May be used for rapid blood smears for differential assessment, as well as detecting *H. pylori* microorganisms. The stain is very useful to pathologists for immediate interpretation of fine needle aspiration biopsies. Technical Data Sheet #715


Helix shaped Helicobacter Pylori bacteria in human colon tissue.

Benefits:
- Excellent cytology stain
- Clear nuclear staining of bacteria and fungus in deep shades of blue
- Save Time – Fast alternative to Wright-Giemsa staining procedures.

Diagnosis of Pneumocystis jirovecii pneumonia by bronchoalvolar lavage in AIDS patients. Comparison of Diff-Quik, fungifluor stain, direct immunofluorescence test and polymerase chain reaction; Acta Cytol, 1995 Nov-Dec, 39(6) 1089-93 2. Diff-Quik Stain as a Simplified Alternative to Papanicolaou Stain for Determination of Quality of Endocervical Specimens Submitted for PCR Detection of Chlamydia trachomatis; Journal of Clinical Microbiology, Oct 1996, p. 2590-2592ii

Hanker-Yates reagent *HVWX7d*	08661-5	5 x 1 g

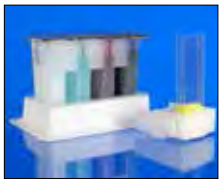
A specific, sensitive and non-carcinogenic chromogen for immunoperoxidase techniques. Contains p-phenylenediamine and pyrocatechol. Gives a blue reaction product.
Technical Data Sheet #204
Histochem. J., 9, 789 (1977); Am. J. Clin. Path., 75, 367 (1981)

Methylene Blue chloride, C.I. 52015, certified [61-73-4] *H5g*	04220-50	50 g

MW 373.9
Sensitive stains for RNA, very good nuclear stain, used in many in vitro diagnostic applications.
Also available in ready-to-use, see page 53 *(Cat. #09978)* Technical Data Sheet #727
Clark, G., Staining Procedures, 4th ed., Williams and Wilkins: Baltimore, 1981

Neat Stain Hematology Stain Kit	25034-1	1 kit

Three-step procedure for differentiation of morphological cell types in peripheral blood smears. Staining characteristics are similar to the traditional Wright's and Wright-Giemsa stains. Neat Stain offers the flexibility of a three dip staining sequence in both the stain and counter-stain solution. Performs 150 tests.



Kit Contains:
- 6 Reagent Packs
- Plastic Stand
- 6 Reclosure foils

Benefits:
- Neat – Self-contained foil sealed, pre-filled multi-well containers
- Fast – Immerse slides sequentially in each reagent for specified time, air dry and read
- Convenient – Additional foils for re-sealing containers

Hematology

	Catalog #	Size
Pyronin Y, C.I. 45005, certified [92-32-0] *U5g*	18614-5	5 g
	18614-25	25 g

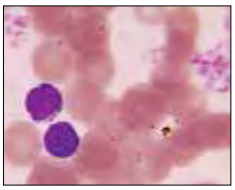
MW 302.8
Used in combination with methyl green for the selective and differential staining of nucleic acids. The pyronin Y stains RNA red, while the methyl green stains DNA green. The combined methyl green-pyronin Y stain is a useful histochemical reagent. Pyronin Y can also be used as a tracking dye for polyacrylamide gel electrophoresis.
Stain Technol., 27, 233 (1952); Clark, G., Staining Procedures, 4th ed., Williams and Wilkins 1981; p199

StainRITE® Giemsa Stain (for May-Grünwald)	25038-100	100 ml
	25038-400	400 ml

Giemsa stain is a classical blood film stain for peripheral blood smears and bone marrow specimens, used to visualize chromosomes, stains fungus histoplasma and identifies mast cells.

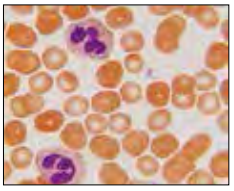
StainRITE® May-Grünwald Stain Solution	24981-1	1 liter
	24981-4	4 liters

May-Grünwald Stain Solution is a classic hematology stain that produces dense coloration in the staining of peripheral blood smears and bone marrows. Technical Data Sheet #813



StainRITE® Wright Stain Solution	24986-1	1 liter
	24986-4	4 liters
	24986-20	20 liters

A dual purpose stain used for staining blood smears and bone marrow aspirates. Ready-to-use solution makes the differentiation of human blood cells much easier to identify.



StainRITE® Wright-Giemsa Stain Solution	24985-1	1 liter
	24985-10	10 liters

Wright-Giemsa Stain Solution is a dual purpose stain useful for blood films, parasites and bone marrow aspirates. Prepared from certified dyes. Ready-to-use solution makes the differentiation of human blood cells much easier to identify. Based on a commonly used Azure-Eosin formula.

Thiazole orange [107091-89-4] *H6gk*	19352-25	25 mg

MW 476.32 mp 270° (dec.)
Fluorescent dye for reticulocyte analysis. Also useful for Plasmodium species analysis. λ max: 512nm
Cytometry, 7, 508 (1986); 8, 568 (1987); Angew. Chem., 111, 2340-2343, (1999); Agnew. Chem. Int. Ed., 38, 2203-2206, (1999)

Wright Stain, certified [68988-92-1] *U4g*	02785-25	25 g
	02785-100	100 g

Useful for staining blood films and malarial parasites in blood films.

Dark stained bipolar ends of Yersinia pestis can clearly be seen in this Wright's stain of blood from a plague victim. Image courtesy of the CDC Public Health Library.

Buffers

StainRITE® May-Grünwald Giemsa Phosphate Buffer pH 7.2	25032-1	1 liter
	25032-4	4 liters

For use as a buffer in May-Grünwald, Wright Stain, Wright-Giemsa, Giemsa and Leishman staining procedures.

Hematology

	Catalog #	Size
StainRITE® Wright-Giemsa Stain Phosphate Buffer pH 6.8 . . . . . Yields satisfactory staining results every time when used with Wright-Giemsa stains. The buffer used in the Wright-Giemsa staining protocol needs to be pH 6.8 or results will be unsatisfactory. If the buffer is too acidic the stain will be too red and nuclei will be too light; if it is too basic the stain will be too blue and cytoplasmic detail will be indistinct. *For quantities of StainRITE® stains exceeding 200 liters, please call for a bulk quote!* Technical Data Sheet #815	24984-1	1 liter
	24984-4	4 liters
StainRITE® Wright Stain Phosphate Buffer pH 6.8 . . . . . Yields satisfactory staining results every time when used with the Wright staining method. The buffer used in the Wright staining protocol needs to be pH 6.8 or results will be unsatisfactory. If the buffer is too acidic the stain will be too red and nuclei will be too light; if it is too basic the stain will be too blue and cytoplasmic detail will be indistinct.	24989-1	1 liter
	24989-4	4 liters

Accessories

BioMasher I®

Disposable Homogenizer for hard samples with small pore size. Non-sterile, non-Autoclavable.

1.5ml Microtube w/o O-ring, PE filter, hard samples	25527-30	30/pk
	25527-120	120/pk
1.5ml Microtube w/o O-ring, PP filter, hard samples	25528-30	30/pk
	25528-120	120/pk
1.5ml Microtube with O-ring, PE filter, soft samples	25525-30	30/pk
	25525-120	120/pk
1.5ml Microtube with O-ring, PP filter, soft samples	25529-30	30/pk
	25529-120	120/pk
2.0ml Microtube w/o O-ring, PE filter, hard samples	25530-30	30/pk
	25530-120	120/pk
2.0ml Microtube w/o O-ring, PP filter, hard samples	25531-30	30/pk
	25531-120	120/pk
2.0ml Microtube with O-ring, PE filter, soft samples	25526-30	30/pk
	25526-120	120/pk
2.0ml Microtube with O-ring, PP filter, soft samples	25532-30	30/pk
	25532-120	120/pk

Hematology

Disposable Hemocytometers	Catalog #	Size
Thoma, 100 Test C-Chip	25521-1	50/pk
Thoma New, 100 Test C-Chip	25522-1	50/pk
Semen Test, 100 Test C-Chip	25517-1	50/pk
No Grid For CASA, 100 Test C-Chip	25516-1	50/pk
Neubauer, 100 Test C-Chip	25515-1	50/pk
Neubauer Improved, 100 Test C-Chip	25514-1	50/pk
Melassez, 100 Test C-Chip	25523-1	50/pk
Fuchs Rosenthal, 100 Test C-Chip	25520-1	50/pk
Burker, 100 Test C-Chip	25518-1	50/pk
Burker Turk, 100 Test C-Chip	25519-1	50/pk

Glass Slide Holder . . . . . 25467-1 — 1 holder

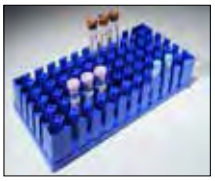
Time saving adjunct to frozen section staining, special staining, immunostaining procedures "from beginning to end."

Features:

- Each Glass Slide Holder holds five slides
- Easy to apply PAP Pen *(Cat. #24231-1)*
- Up to 50 slides (10 holders) can be processed in one staining vessel
- Batch of 100, 150 or more can be processed
- Multiple slides can be handles efficiently
- Help minimize technicians exposure Time to xylene, alcohol, and DAB, etc.

SmoothRack – Test Tube Rack . . . . . 25063-1 — 1 unit

SmoothRack employs uniquely designed supports to prevent tubes from slipping out of position. Accommodates up to 72 tubes from 10 to 16mm in diameter. Autoclavable polypropylene.



Dimensions – 9.75"l x 5"w x 2.564"h

Hematology

	Catalog #	Size

StainTray™ Slide Staining System

A user friendly approach to immunohisto-chemistry staining. This tray is also suitable not only for routine staining requiring a humid chamber, but also ideal for Hematology, Cytology and Microbiology laboratories. Manipulation is made safe and easy by using only one hand.

Black base made of tough ABS plastic withstanding a wide range of chemicals (Avoid chlorinated hydrocarbons). Accepts 10 or 20 slides on four plastic rails covered with a polymer strip to perfectly hold slides even if tray is held at an angle. When humidity is needed, wells between rails will hold up to one ml of water securely without splashing. Middle wells will hold up to 2 ml each. Rails are raised not only to avoid water touching the slides but to make them more easily retrievable. Base will also hold excess stain solution dripping from the slides. Four rubber feet ensure greater base stability. Units are stackable for space saving purposes.

Two cover styles are available:

- Clear, allowing for visual examination. Made of PETG with a temperature range of -20° C to 60° C
- Black, for fluorescent work. Made of ABS with a temperature range of -80° C to 80° C

Dimensions with cover:

- 10 Slide – 24x24x4.5 cm H (9 3/8x9 3/8 x1 3/4 in. H)
- 20 Slide – 38x24x4.5 cm H. (15x9 3/8 x1 3/4 in. H)

Base (10 Slide Capacity) – Black	25498-1	1 unit
Base (10 Slide Capacity) – Clear	25497-1	1 unit
Base (20 Slide Capacity) – Black	25502-1	1 unit
Base (20 Slide Capacity) – Clear	25501-1	1 unit
Lid (10 Slide Capacity) – Black	25500-1	1 unit
Lid (10 Slide Capacity) – Clear	25499-1	1 unit
Lid (20 Slide Capacity) – Black	25504-1	1 unit
Lid (20 Slide Capacity) – Clear	25503-1	1 unit

Microbiology

Fixatives

Eco-Fix Derm Fixative *X7g* . . . . . 25060-4 4 liters

The fixation characteristics of Eco-Fix Derm Fixative are much better than those of formaldehyde-based fixatives, yielding consistent results even after long-term fixation. Carbohydrates, proteins, antigenic sites and nucleic acids are all effectively preserved. Tissues fixed with Eco-Fix Derm Fixative have a similar appearance to those fixed in formalin-based fixatives and also show more sensitive staining results.

Features:

- Specifically formulated for skin samples
- Ideal for Histochemistry, Immunohistochemistry & In Situ Hybridization
- Offers all the features of Eco-Fix Tissue Fixative

Microbiology

	Catalog #	Size
Eco-Fix MB (Molecular Biology) Tissue Fixative, 1x *H3g*	25058-4	4 liters

Specially formulated to preserve antigenic sites (for antibody probes) and nucleic acid sites (for in-situ hybridizations) in their native state making predigestion or other recovery procedures for these important sites unnecessary. Replaces common fixatives including: formaldehyde-based, alcohol-based, Zenker's, B5 & B3, Bouin's and other fixatives and provides superior results. Tissues fixed in Eco-Fix MB exhibit vibrant staining, better nuclear and cytoplasmic detail and will retain a crisp appearance even after long-term fixation. Eco-Fix MB tissue fixative also retains a much more natural look and feel than formalin fixed tissue. Softer tissues mean easier, smoother cutting and sectioning. Technical Data Sheet #887

Features:

- Non-formalin based tissue fixative designed for molecular biology applications
- Preserves antigenic sites and nucleic acid sites in their native state
- Tissue retain natural look and feel compared to formalin fixed tissues
- Safe, non-toxic fixative - contains no formaldehyde, glutaraldehyde or mercury

PVA "Gold Standard" Fixative	24680-16	16 oz

A low viscosity poly vinyl alcohol recommended for permanent staining. Mercury free alternative, saves time, easier and less expensive disposal.

Z-PVA® Fixative	24679-16	16 oz

(Zinc Sulfate PVA)
Mercury free fixative developed as an excellent alternative to mercuric chloride PVA for permanent staining. Mercury free alternative, saves time, easier and less expensive disposal.

SAF Fixative	24677-16	16 oz

Sodium Acetate Acidic Acid Formalin
Mercury free fixative recommended for permanent staining, concentration, EIA and ELISA procedures. Albumin adhesive is included.

Features:

- Mercury free alternative
- Saves Time
- Easier and less expensive disposal

General Reagents

Sodium Polyanethole Sulfonate [52993-95-0] *AH4g*	24139-5	5 g

$[CH(C_6H_3[SO_3Na]OCH_3)CH(CH_3)-]_x$
For inhibition of blood coagulation in vitro and to stabilize collodial solutions like milk and gelatin.

XTT [111072-31-2] *HU7ad*	19661-100	100 mg
	19661-500	500 mg

(Tetraxolium XTT; Sodium 3'-[1-phenylamino-carbonyl]-3,4-tetrazolium]-bis[4-methoxy-6-nitro]benzenesulfonic acid hydrate) MW 673.5
Useful in in vitro cell growth assays with possible applicability to a variety of problems in cellular pharmacology and biology. An improved colorimetric assay for cell proliferation and viability utilizing XTT has been reported. An XTT-based colorimetric cellular cytotoxicity assay for melanoma and other tumor cells has also been reported. Technical Data Sheet #486
Cancer Res., 48, 4827 (1988); J. Immunol. Methods, 142, 257 (1991); 147, 153 (1992)

Dyes & Stains

Acridine mutagen ICR 191 [17070-45-0] *HU6bg*	08704-100	w

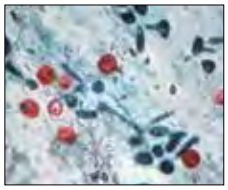
([6-Chloro-9-(3-[2-chloroethylamino]propylamino)-2-methoxyacridine] dihydrochloride; ICR 191 Acridine mutagen; Ames mutagen 191) MW 451.2
Frameshift mutagenic standard for Ames test in *Salmonella* and *E. Coli*.
Science, 176, 47 (1972); Ann. N.Y. Acad. Sci., 269, 21 (1975); J. Med. Chem., 15, 739 (1972); Proc. Nat'l. Acad. Sci., USA, 72 5135 (1975)

Microbiology

	Catalog #	Size
New! AFB Kinyoun Kit (Cold Method) *CHVWX7g*	25765-1	1 kit
AFB Kinyoun Stain Kit with Mycobacterium Control Slide	25458-1	1 kit
AFB Rhodamine-Auramine Kit (Fluorescent)	24666-1	1 kit
AFB Ziehl-Neelson Kit (Hot Method) *CH6g*	24669-1	1 kit

New! AFB Kinyoun Kit (Cold Method) *CHVWX7g*

Method of staining acid-fast microorganisms, specifically mycobacterium. Procedure is similar to Ziehl-Neelson stain, but does not involve heating the slides. Kinyoun staining method uses carbol-fuchsin as a primary stain, followed by decolorization with an acid-alcohol solution and methylene blue as a counterstain. Kinyoun carbol-fuschsin has a greater concentration of phenol and basic fuchsin and does not require heating in order to stain properly. When viewed under a microscope, Kinyoun stained slides will show acid-fast organisms as red and non acid-fast organisms as blue. Technical Data Sheet #747



Direct fecal smear is stained to detect Cryptosporidium sp., an intracellular protozoan parasite using a modified cold Kinyoun acid-fast staining technique. Image courtesy of CDC Public Health Library

Kit Contains 8 oz. bottles of each:

- Carbol Fuchsin (Kinyoun)
- Acid Alcohol
- Methylene Blue

AFB Kinyoun Stain Kit with Mycobacterium Control Slide

Combined Stain and control slide kit that enables the end user to complete testing without a fluorescent microscope. Obtain results in less than 5 minutes. The selection of materials for these quality control slides was based on the Acid Fast staining characteristics of Mycobacterium. This quality control slide provides two air-dried and methanol-fixed droplets within two etched circles. The circle nearest the label contains an Acid-Fast- positive Mycobacterium and the circle furthest contains an Acid-Fast-Negative Coryneform bacterium. Method of staining acid-fast microorganisms, specifically mycobacterium. Procedure is similar to Ziehl-Neelson stain, but does not involve heating the slides.

Kit Contains: Two 10ml bottles each of:

- Carbol Fuchsin (Kinyoun)
- Acid Alcohol, Methylene Blue
- 10 control slides

AFB Rhodamine-Auramine Kit (Fluorescent)

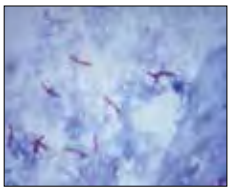
The identification of Mycobacteria with rhodamine-auramine is due to the affinity of the mycolic acid in the cell walls for the fluorochromes. Dyes will bind to the Mycobacteria, which appear bright yellow or orange against a greenish background. The potassium permanganate helps prevent non-specific fluorescence. All acid-fast organisms will be stained by rhodamine-auramine, including the sporozoan parasites. Technical Data Sheet #748

Kit Contains 8 oz. bottles of each:

- Rhodamine – Auramine
- Fluorescent Decolorizer
- Potassium – Permanganate

AFB Ziehl-Neelson Kit (Hot Method) *CH6g*

Bacteriological stain kit used to identify acid-fast organisms, mainly Mycobacteria. Helpful in diagnosing Mycobacterium tuberculosis since its lipid rich cell wall makes it resistant to Gram stain. Can also be used to stain other bacteria like Nocardia. Kit contains a primary dye (carbol-fuchsin), a decolorizer (acid-alcohol) and a counter stain (methylene blue). Decolorizer is used to decolorize the bacteria that "dislike" the primary stain. Counter stain is used to stain those bacteria which were decolorized by the acid alcohol. Acid-fast bacilli will stain bright red, while non-acid fast organisms will stain blue or green.
Technical Data Sheet #746



Mycobacterium tuberculosis bacteria revealed using acid-fast Ziehl- Neelson stain; Magnified 1000X. Image courtesy of CDC Publich Health Library/ Dr. George P. Kubica.

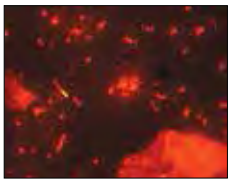
Kit Contains 8 oz. bottles of each:

- Carbol Fuchsin (Ziehl-Neelson)
- Acid Alcohol
- Methylene Blue

Microbiology

	Catalog #	Size
Auramine O Stain Kit	24665-1	1 kit

Acid-fast mycobacteria resist decolorization by acid-alcohol after primary staining owing to the high lipid (mycolic acid) content in their cell walls. The identification of mycobacteria with auramine O is due to the affinity of the mycolic acid in the cell walls for the fluorochromes. The dye will bind to the mycobacteria, which appear as bright yellow luminous rods against a dark background. The potassium permanganate helps prevent non-specific fluorescence. Technical Data Sheet #751



M. tuberculosis in a sputum smear is stained using fluorescent auramine with acridine orange counterstain; 950x. CDC Public Health Library.

Bromophenol Blue, ACS [115-39-9]	24995-5	5 g
	24995-25	25 g

MW 669.96 $C_{19}H_{10}Br_4O_5S$
Bromophenol blue is useful as an acid-base indicator, a color marker and a dye. As an acid-base indicator its range lies between pH 3.0 and 4.6. Suitable as a color marker in agarose gel electrophoresis and polyacrylamide gel electrophoresis and commonly used as a dye to stain proteins in slides. λ max: 422nm
Merck 13, 1429 Beilstein 19, V, 3, 458

Bromothymol Blue, ACS [76-59-5]	25009-25	25 g
	25009-50	50 g

MW 624.38 mp 200 – 202° C $C_{27}H_{28}Br_2O_5S$
Bromothymol blue is a chemical indicator for weak acids and bases, useful for observing photosynthetic activities or respiratory indicators (turns green then yellow as CO2 is added). λ max: 420nm
Merck 13, 1430 Beilstein 19, V, 3, 461

Bromothymol Blue, Sodium Salt, ACS [76-59-5]	24996-25	25 g

MW 646.36 $C_{27}H_{27}Br_2NaO_5S$
Bromothymol blue is a chemical indicator for weak acids and bases, mostly used in measuring substances that would have relatively low acidic or basic levels (near a neutral pH). Suitable for use in the laboratory as a biological slide stain. λ max: 420nm
Merck 13, 1430 Beilstein 19, V, 3, 461

Chlorophenol red [4430-20-0] *H4g*	03266-10	10 g

(3,'3-Dichlorophenol sulfone phthalein) MW 423.3
pH indicator; transition interval from pH 4.8 (yellow) to 6.7 (violet). λ max: 572nm

Crystal Violet	24686-1	1 gal

Used in the Gram's Staining method for the difference of Gram Positive and Gram Negative bacteria. Also used to detect Biofilms in contact lenses.

Cyanoditolyl Tetrazolium Chloride (CTC) [102568-47-8] *HU6ad*	19292-100	100 mg
	19292-1	1 g

MW 311.8 mp 230° Soluble in ~100mg in 6.6cc water.
Cyanoditolyl tetrazolium chloride has been used to measure the redox activity of tumor cells. It has also been employed for direct epifluorescent microscopic enumeration of respiring bacteria in food samples and environmental samples, especially water samples. Reveals a quantitative methodology for measuring marine bacteria. These methods yield 80% activity in 2 to 10 minutes. Cell samples mixed with CTC can be stored refrigerated or frozen in liquid nitrogen for at least 4 weeks without a significant loss of cells. Formazan fluoresces in solid state. Em. max: 630nm Ex. max: 450nm Technical Data Sheet #486

E. coli bacteria in CTC

Histochem. J. 19, 21 (1987); Appl. Environ. Microbiol., 58, 1801 (1992); Appl. Environ. Microbiol., 65(5), 1966 (1999); Appl. Environ. Microbiol., 69(4), 2166 (2003); Flow Cytometric Analysis: Appl. Environ. Micro. June 1999, p. 2409-2417 Vol. 65 (6)

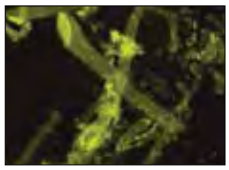
Filipin (from Streptomyces filipinensis) [11078-21-0] *HO6d*	08707-50	50 mg
	08707-100	100 mg

Polyene antibiotic fluorochrome for cholesterol determination. Used as an antifungal agent.
Cytometry, 8, 146 (1987)

Microbiology

	Catalog #	Size
Fungi-Fluor® Kit for Fungal Detection	17442-1	1 kit

Many opportunistic infections develop in the immunosuppressed patient suffering from AIDS. A number of these are caused by various fungal species including Candida, Aspergillus, Histoplasma, and Coccidioides. Fungi-Fluor Kit for Fungal Detection offers a quick fluorescent stain/counterstain procedure for various fungal organisms. Can be used to screen a variety of specimen types from sputum to skin scrapings for fungal detection. Technical Data Sheet #316



Aspergillus culture stained with Fungi-Fluor®, no counterstain, 40X, FITC filter.

Benefits:

- More accurate than KOH preps
- Rapidly offers greater morphologic detail than PAS or silver stains
- Counterstain greatly reduces background fluorescence
- One kit stains over 500 slides
- FDA approved for in vitro diagnostic use in the United States

Specimen types:

- Fresh or frozen clinical specimen
- Paraffin or GMA-embedded tissues

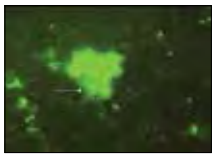
Kit Contains:

- 75ml of staining solution A
- 75ml of counterstaining solution B

Fungi-Fluor® Kit for Fungal Detection is sold in Europe under (Cat. #17442E-1). For European orders, please call or visit our website.

	Catalog #	Size
Fungi-Fluor® Pneumocystis Kit *HU2agm*	22363-1	1 kit

Pneumocystis carinii is an organism that can cause *Pneumocystis carinii* pneumonia (PCP) in severely immune compromised patients. Early detection allows the introduction of appropriate treatment and may improve the chances of patient survival. The Fungi-Fluor® Pneumocystis Kit offers a fast, fluorescent staining procedure for *Pneumocystis carinii* in bronchial specimens. 100 tests per kit. Technical Data Sheet #482



Benefits:

- Direct fluorescent stain for *Pneumocystis carinii* cyst
- Unique fluorescent morphology ("double parenthesis" structure) is easy to identify
- 3 minutes to stain and read
- Permanent slides – slides can be reactivated if fluorescence dims
- Minimal prep and clean-up
- Better results than with methenamine silver staining
- FDA approved for in vitro diagnostic use in the United States

Specimen Types:

- Bronchoalveolar lavage (BAL)
- Bronchial brush or wash
- Touch prep of fresh tissue
- Paraffin section and frozen sections

Kit Contains:

- 10ml of Fungi-Fluor® staining solution
- 10 positive unstained control slides (smears)

Fungi-Fluor® Pneumocystis Kit is sold in Europe under (Cat. #22363E-1). For European orders, please call or visit our website.

Microbiology

	Catalog #	Size
Gram's Decolorizer Used in Gram Staining protocols. The Gram stain is used to classify bacteria on the basis of their forms, sizes, cellular morphologies, and Gram reactions.		
(50/50)	24683-1	1 gal
(75/25)	24682-1	1 gal
Gram's Iodine . . . . . . Used in Gram Staining protocols. The Gram stain is used to classify bacteria on the basis of their forms, sizes, cellular morphologies and Gram reactions.	24684-1	1 gal
Gram's Iodine - Stabilized . . . . . . A component of the Gram Stain. Gram stain is used to classify bacteria on the basis of their forms, sizes, cellular morphologies and Gram reactions.	24685-1	1 gal
Gram's Stain Kit with Iodine . . . . . . Gram stain permits the separation of all bacterial species into two large groups, those which retain the primary dye (gram-positive) and those which lose the primary dye and take the color of the secondary dye (gram-negative). The mechanism of gram stain is based on the distinctive chemistry and physical properties of the cell wall, possibly the lipid content. However, the exact mechanism of gram stain is still unknown. Technical Data Sheet #749 Kit Contains 8 oz. bottles of each: • Crystal Violet • Gram's Iodine • Decolorizer • Safranin	24668-1	1 kit
Gram's Stain Kit with Stabilized Iodine . . . . . . The gram stain permits the separation of all bacterial species into two large groups, those which retain the primary dye (gram-positive), and those which lose the primary dye and take the color of the secondary dye (gram-negative). The mechanism of gram stain is based on the distinctive chemistry and physical properties of the cell wall, possibly the lipid content. However, the exact mechanism of gram stain is still unknown. Kit Contains 8 oz. bottles of each: • Crystal Violet • Gram's Iodine • Decolorizer • Safranin	24667-1	1 kit
Grocott Methenamine Silver (GMS) Stain Kit with Pneumocystis Control Slides . . . . . Used for the identification of *Pneumocystis jirovecii* and fungal organisms in tissue sections. Also useful in staining carbohydrates. Kit is ready to use, complete with 10 *Pneumocystis carinii Two-Well Control Slides. (Cat. #25412)* Kit Contains: • 100ml – 3.8% chromium trioxide aqueous solution • 100ml – 1% sodium bisulfite aqueous solution • 9ml – 5% silver nitrate aqueous solution • 180ml – Methenamine solution • 50ml – 5% Borax aqueous solution • 100ml – 0.2% gold chloride aqueous solution • 100ml – 2% Sodium thiosulfite aqueous solution • 20ml – 0.5% Light Green stock solution • 10 slides – Pneumocystis carinii Two-Well Control Slides	25462-1	1 kit

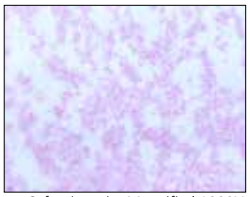
Microbiology

	Catalog #	Size
Lissamine Rhodamine B sulfonyl chloride, ~99% [62796-29-6] *H3g* . . . . . MW 577.1 Fluorescent protein stain with bright orange fluorescence. Used to visualize actin filaments in living amoebas. Useful for waste water testing and various microbiological applications. *J. Cell. Biol. 86, 590 (1980)*	08074-100	100 mg
NALC + Digestant Kit . . . . . Sodium hydroxide (NaOH), in the TB Base Digestant, acts as an emulsifier and a decontaminant, breaking down mucoid material and inhibiting the growth of contaminants. Sodium citrate, in the TB Base Digestant, aids in the liquification by binding heavy metals, thus stabilizing N-Acetyl-L-Cysteine (NALC) and allowing it to work properly. N-Acetyl-L-Cysteine (NALC), when combined with Sodium hydroxide (NaOH), facilitates decontamination by further digesting mucopurulent specimens which allows the NaOH to penetrate. Store at 2 – 8° C Technical Data Sheet #752	24676-1	1 kit
Neat Stain Hematology Stain Kit with Blood Parasite Control Slides . . . . . Three-step procedure for differentiation of morphological cell types in peripheral blood smears. Staining characteristics are similar to the traditional Wright's and Wright-Giemsa stains. Neat Stain offers the flexibility of a three dip staining sequence in both the stain and counter-stain solution. Performs 25 Tests. Neat Stain Slide Holder sold separately *(Cat. #25033)* Kit Contains: • 1 Reagent Pack, Plastic Stand, 1 Re-closure foil, 10 Blood Parasite slides • Each slide provides an air-dried, methanol fixed, thin blood smear containing Plasmodium, Babesia, or Trypanosoma.	25460-1	1 kit
Neat Gram Stain Kit with Gram +/- Control Slides . . . . . For staining bacteria from cultures or specimens by the differential Gram stain method. Kit performs 25 tests, with 10 control slides, both positive and negative Gram staining organisms on each slide. Neat Stain Kits have been specifically designed for stat procedures and/or laboratories using manual staining methods. Features: • Neat – Self-contained foil sealed, pre-filled multi-well containers • Fast – Immerse slides sequentially in each reagent for specified time, air dry and read • Convenient – Additional foils for re-sealing containers Kit Contains: • 1 Reagent Pack • 1 Reclosure foil • 10 Gram positive and gram Negative Control Slides	25459-1	1 kit
Neat Stain Gram Stain Kit *CH5g* . . . . . For staining bacteria from cultures or specimens by the differential Gram stain method. Kit performs 150 tests. Neat Stain offers the flexibility of a three dip staining sequence in both the stain and counter-stain solution. Benefits: • Neat – Self-contained foil sealed, pre-filled multi-well containers • Fast – Immerse slides sequentially in each reagent for specified time, air dry and read • Convenient – Additional foils for re-sealing containers Kit Contains: • 6 Reagent Packs • Plastic Stand • 6 Reclosure foils	25036-1	1 kit

Microbiology

	Catalog #	Size
0.4% Safranin, Ready-to-Use *CH4g*	24672-1	1 gal

The classic counterstain in a Gram stain. Our ready-to-use format eliminates the exposure to potentially irritating powdered dyes.



Francisella tularensis using a Safranin stain, Magnified 1000X.
Courtesy of CDC Public Health Library / Dr. P. B. Smith.

Szechrome NAS *U3g*	08762-5	5 g

Suitable for the determination of the nitrate content of natural waters, industrial waste effluents, soil, plant and meat extracts, tinned goods, biological fluids (sputum, urine), chemicals, fertilizers and drugs. NAS has been used in place of the phenoldisulfonic acid, brucine and chromotropic acid methods used previously. This sensitive reagent reacts rapidly to produce stable colors suitable for precise quantitative determinations or rapid estimations in routine field work. Szechrome NAS produces color reactions which are specific and proportional to the nitrate content of the sample tested. Optical density (OD) at 570nm after 5 min. development is proportional to nitrate in the range of 2-20ppm. Technical Data Sheet #239

TB Fluorostain Kit	22422-1	1 kit

Fluorochrome staining of mycobacteria in an acid-fast smear offers several advantages over traditional carbol-fuchsin methods. Lower magnification is required; fluorescent mycobacteria stand out brightly on a darkened background. Smaller numbers of mycobacteria are easily identified with a fluorescent stain. 100 tests per kit. Technical Data Sheet #488

Features:

- Less than 12 minutes to perform staining
- Microwave method reduces time and enhances results
- Much less Auramine O and Rhodamine B used, reducing costs and hazards
- Faster, superior counterstain
- FDA approved for in vitro diagnostic use in the United States

Kit Contains:

- 525ml of Staining Solution A
- 500ml of Acid Solution B
- 500ml Counterstaining Solution C

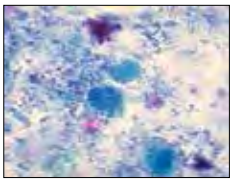
Uvitex® 2B [27344-41-8] *BH6g*	19517-10	10 g

(C.I. Fluorescent Brightener 362; Derivative of stilbene disulfonic acid.) TSCA
UV absorver. Em. max: 435nm in PBS Buffer Ex. max: 350nm
Appearance: Yellow powder

Microbiology

	Catalog #	Size
Wheatley's Trichrome Blue *H4g*	24691-16	16 oz

This multi-chromatic method yields rapid staining and excellent definition on amoebae and flagellates. PVA fixed stool specimens should be allowed to dry overnight. Blood cells and bacteria stain red, while yeast and vegetable fibers stain green. In tissue sections connective tissue is green, muscle and cytoplasm red, and nuclei blue. Technical Data Sheet #750



Entamoeba histolytica trophozoite. Wheatley's trichrome stain (blue filter). Image courtesy of CDC Public Health Library/Dr. Lanny Dykes.

Control slides

Acid Fast Control Slides	25410-1	10 slides

This quality control slide provides two air-dried and methanol-fixed droplets within two etched circles. The circle nearest the label contains a droplet of an Acid Fast-Positive *Mycobacterium gordonae*, a derivative of ATCC® 14470™*. The circle furthest from the label contains a droplet of an Acid Fast-Positive *Cryptosporidium* in a fecal sample and also contains Acid Fast-Negative intestinal bacteria.

Blood Parasite Control Slides	25411-1	10 slides

This quality control slide provides an air-dried, methanol-fixed, thin blood smear containing *Plasmodium, Babesia* or *Trypanosoma*.

Cryptosporidium Control Slides	25408-1	10 slides

This quality control slide provides a single, air-dried and methanol-fixed fecal smear containing Acid Fast-Positive *Cryptosporidium* and Acid Fast-Negative intestinal bacteria.

FYC Control Slides	25418-1	10 slides

This quality control slide provides a single, air-dried and methanol-fixed preparation containing *Candida albicans*, a derivative of ATCC® 10231™*.

Gram Stain Control Slides *(e. Coli & S. aureus)*	25417-1	10 slides

This quality control slide provides two air-dried and methanol-fixed droplets within two etched circles. The circle nearest the label contains a droplet of Gram-Positive *Staphylococcus aureus* a derivative of ATCC® 25923™*. The circle furthest from the label contains a droplet of a Gram-Negative Escherichia coli a derivative of ATCC® 25922™*.

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MYC-D Control Slides	25419-1	10 slides

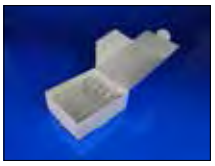
This quality control slide provides a single, air-dried and methanol-fixed preparation containing *Candida albicans*, a derivative of ATCC® 10231™* with Leucocytes and Erythrocytes.

Mycobacterium Control Slides	25409-1	10 slides

This quality control slide provides two air-dried and methanol-fixed droplets within two etched circles. The circle nearest the label contains an Acid Fast-Positive *Mycobacterium gordonae*, a derivative of ATCC® 14470™* and the circle furthest from the label contains an Acid Fast-Negative *Erysipelothrix rhusiopathiae*, a derivative of ATCC® 19414™*.

Pneumocystis carinii Control Slide *U2g*	22251-1	10 slides

Designed to be used with our Fungi Fluor Kit Pneumocystis Kit *(Cat. #22363)*, these slides are unstained. Technical Data Sheet #483



Microbiology

	Catalog #	Size
Pneumocystis carinii Two-Well Control Slides This quality control slide is Teflon coated with two 7 mm wells containing homogeneous suspensions of methanol-fixed rat lung tissue. One well contains normal rat lung tissue; the other contains rat lung heavily infected with *Pneumocystis carinii* cysts and trophs. There is a frosted area at one end for labeling use.	25412-1	10 slides
Protozoan (SAF) Control Slides This quality control slide provides an air-dried, SAF preserved, fecal smear containing a representative intestinal protozoa, usually *Giardia lamblia*.	25415-1	10 slides
Protozoan (Zinc PVA) Control Slides This quality control slide provides an air-dried, Zinc PVA-preserved, fecal smear containing a representative intestinal protozoa, usually *Giardia lamblia*.	25413-1	10 slides

Rapid Bacteria Test Strips

Bacti Strips
Convenient method for the detection of urinary tract infections. Sterile strips of filter paper (60mm x 5mm) with score 15mm from one end. Cost effective, simple test for quantification of bacteria in urine, small contact area allows many specimens to be tested on one petri dish.
Technical Data Sheet #980

24642-1 — 1000 strips

Beta Strips
Rapid diagnostic test for penicillin resistant bacteria. Paper strip impregnated with benzylpenicillin and indicator, ready for immediate use. Changes color on contact with material containing β-lactamase. Rapid test – result within 5 minutes, paper strip ready for immediate use, very clear reaction.
Technical Data Sheet #981

24641-1 — 25 strips

Indole Strips
(dimethylaminobenzaldehyde)
Rapid diagnostic test for tryptophan hydrolysis by *E. coli.* Paper strip impregnated with p-dimethylamino-cinnamaldehyde (DMACA), ready for immediate use. 12 month shelf life. Results within one minute, can be performed directly on primary isolates from urine on blood agar, very clear reaction. Technical Data Sheet #982

24638-1 — 25 strips

MRSA Strips
Traditional strip based sensitivity test for simple identification of Methicillin Resistant *Staphylococcus Aureus* (MRSA) bacteria. Convenient single strip instead of discs, easy to set up and read, up to 6 test organisms per plate. Technical Data Sheet #983

24643-1 — 50 strips

Oxidase Strips
Offers a rapid in vitro qualitative test to assist in the identification of microorganisms isolated from clinical specimens. Intended to qualitatively detect the cytochrome oxidase activity (oxidase test) within one minute. Oxidase test is an important differential procedure to assist in the identification of various microorganisms isolated from clinical specimens. Rapid test – result within seconds, paper strip ready for immediate use, very clear reaction. Technical Data Sheet #984

24637-1 — 25 strips

Microbiology

	Catalog #	Size
Urease Strips	24639-1	25 strips

Rapid diagnostic test for urease enzyme in *Helicobacter* or *Proteus*. Paper strip impregnated with urea and indicator, ready for immediate use. 12 month shelf life. Rapid test – result within 4 hours, very clear reaction. Technical Data Sheet #986

KWIK-STIK™ QC – For Culture Purposes and Quality Control Applications

The KWIK-STIK™ is well-known for its clever design and accurate, repeatable results. Each KWIK-STIK™ device features a single microorganism strain in a lyophilized pellet, a reservoir of hydrating fluid, and inoculating swab. For added convenience, a peel-off identification label is included for easy documentation.

KWIK-STIK™ QC – For Culture Purposes and Quality Control Applications

Aspergillus brasiliensis ATCC® 16404™*	25543-2	2/pk
Bacillus subtilis subsp. spizizenii ATCC® 6633™*	25545-2	2/pk
Clostridium sporogenes ATCC® 19404™*	25546-2	2/pk
Enterobacter cloacae subsp. cloacae ATCC® 35030™*	25549-2	2/pk
Enterococcus faecalis ATCC® 19433™*	25551-2	2/pk
Listeria monocytogenes ATCC® 19115™*	25553-2	2/pk
Salmonella enterica subsp. enterica serovar Abony NCTC 6017	25555-2	2/pk
Staphylococcus aureus subsp. aureus ATCC® 6538™*	25560-2	2/pk
Staphylococcus aureus subsp. aureus ATCC® 6538P™*	25558-2	2/pk

LYFO DISK® QC Microorganism Prep

LYFO DISK® is a lyophilized pellet containing a single strain of a microorganism and is the most economical reference stock culture option. LYFO DISK® is known for its ease-of-use; simply re-hydrate the pellet and inoculate. LYFO DISK® is available in a re-sealable vial containing 10 pellets of a single microorganism strain.

LYFO DISK® QC Microorganism Prep

Aspergillus brasiliensis ATCC® 16404™*	25542-6	6/pk
Bacillus subtilis subsp. spizizenii ATCC® 6633™*	25544-6	6/pk
Clostridium sporogenes ATCC® 19404™*	25547-6	6/pk
Enterobacter cloacae subsp. cloacae ATCC® 35030™*	25548-6	6/pk
Enterococcus faecalis ATCC® 19433™*	25550-6	6/pk
Listeria monocytogenes ATCC® 19115™*	25552-6	6/pk
Salmonella enterica subsp. enterica serovar Abony NCTC 6017	25554-6	6/pk
Salmonella enterica subsp. enterica serovar Typhimurium ATCC® 14028™*	25556-6	6/pk
Staphylococcus aureus subsp. aureus ATCC® 6538™*	25559-6	6/pk
Staphylococcus aureus subsp. aureus ATCC® 6538P™*	25557-6	6/pk

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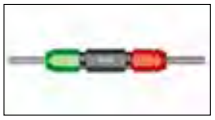
Microbiology

Microloop® Calibration Gauge

	Catalog #	Size
Microloop® Calibration Gauge for 1µl	24652-1	1 gauge

Double ended tool. Each end has an accurately machined solid cylinder of stainless steel of defined diameter. Correctly calibrated loop will fit over green end, but not red end.
Features: Ensure accuracy of procedures, simple to use, robust construction ensures many years of use.



Microloop® Holders

Microloop® Holders
Brass, insulated holder.

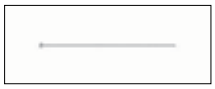
150mm (6" long)	24662-1	1 holder
175mm (7" long)	24663-1	1 holder
205mm (8" long)	24664-1	1 holder

Microloop® Inoculation Loops

Nichrome® Straight Wire Microloop®	24661-1	25 wires

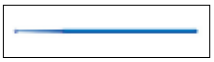
Nichrome® 5 nickel-chromium straight wire needle for picking colonies from agar plates. Accurate sampling, consistent and reproducible results, Rapid cooling, Nichrome 5 is most durable alloy for repeated heating/cooling, outstanding performance at temperatures up to 1200° C.

Nichrome Wire Microloop®
Nichrome® 5 nickel-chromium wire inoculating loop for precise volumetric sampling and transfer of material for accurate analysis. Accurate sampling, consistent and reproducible results, rapid cooling, Nichrome® 5 is most durable alloy for repeated heating /cooling, Outstanding performance at temperatures up to 1200° C.



1.5mm volume, 1µl	24660-1	25 loops
2.2mm volume, 2µ	24659-1	25 loops
2.5mm volume, 2.5µl	24658-1	25 loops
2.9mm volume, 3.3µl	24657-1	25 loops
3.5mm volume, 5µl	24656-1	25 loops
5mm volume, 10µl	24651-1	25 loops

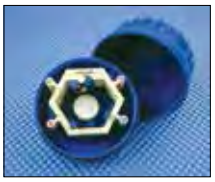
Plastic Microloops®
Sterile disposable plastic inoculating loops for precise volumetric sampling and transfer of material for accurate analysis. Individually packed in peel pouch.



1µl	24649-1	1000 loops
5µl	24650-1	1000 loops
10µl	24648-1	1000 loops

Microbiology

Microrings®

	Catalog #	Size
Microring® AC Ready-to-use, paper ring with 3 individual printed tips containing various antimicrobial reagents. The resistance or sensitivity patterns can be used to help identify *anaerobic cocci*. Technical Data Sheet #741	24654-1	50 rings
Microring® AN Ready-to-use, paper ring with 6 individual printed tips containing various antimicrobial reagents. The resistance or sensitivity patterns can be used to help identify non-sporing anaerobic bacteria. Technical Data Sheet #741	24645-1	50 rings
Microring® GV Ready-to-use, paper ring with 4 individual printed tips containing various antimicrobial reagents. On blood agar *Gardnerella* is identified by sensitivity to 3 designated tips and resistance to 1 tip. Technical Data Sheet #741 	24655-1	50 rings
Microring® XV Ready-to-use, paper ring with individual printed tips containing X (Haemin), V (NAD), or X+V Factors. Haemophilus species vary in their requirement for X and V factors and can be identified by their growth patterns close to the tips. V-tip also contains δ-aminolaevulinic acid (ALA) for Porphyrin Test. Technical Data Sheet #741	24644-1	50 rings
Transwab® with Plain Medium White plastic shaft swab with rayon bud, mounted in blue bell-cap swab holder. Shrouded Bell-Cap grips both the inside and outside of the transport tube to prevent accidental contact with potentially infectious parts of the swab or tube while ensuring containment of the specimen. Transport tube contains Transwab medium without charcoal, based on Amies formulation. 2 year shelf-life. *CE-marked, conforms to European Medical Devices Directive (93/42/EEC), 1993, Official Journal of European Communities, L169 European In Vitro Diagnostic Medical Devices Directive (98/79/EC), 1998, Official Journal of European Communities, L331/1*	24647-1	125 swabs

Molecular Biology

	Catalog #	Size

Fixatives

Eco-Fix Derm Fixative *X7g* . . . . . 25060-4 4 liters

The fixation characteristics of Eco-Fix Derm Fixative are much better than those of formaldehyde-based fixatives, yielding consistent results even after long-term fixation. Carbohydrates, proteins, antigenic sites and nucleic acids are all effectively preserved. Tissues fixed with Eco-Fix Derm Fixative have a similar appearance to those fixed in formalin-based fixatives and also show more sensitive staining results.

Features:

- Specifically formulated for skin samples
- Ideal for Histochemistry, Immunohistochemistry & In Situ Hybridization
- Offers all the features of Eco-Fix Tissue Fixative

Eco-Fix MB (Molecular Biology) Tissue Fixative, 1x *H3g* . . . . . 25058-4 4 liters

Specially formulated to preserve antigenic sites (for antibody probes) and nucleic acid sites (for in-situ hybridizations) in their native state making predigestion or other recovery procedures for these important sites unnecessary. Replaces common fixatives including: formaldehyde-based, alcohol-based, Zenker's, B5 & B3, Bouin's and other fixatives and provides superior results. Tissues fixed in Eco-Fix MB exhibit vibrant staining, better nuclear and cytoplasmic detail and will retain a crisp appearance even after long-term fixation. Eco-Fix MB tissue fixative also retains a much more natural look and feel than formalin fixed tissue. Softer tissues mean easier, smoother cutting and sectioning. Technical Data Sheet #887

Features:

- Non-formalin based tissue fixative designed for molecular biology applications
- Preserves antigenic sites and nucleic acid sites in their native state
- Tissue retain natural look and feel compared to formalin fixed tissues
- Safe, non-toxic fixative - contains no formaldehyde, glutaraldehyde or mercury

Dyes & Stains

Acridine Orange, C.I. 46005, very high purity [65-61-2] *HU5e* . . . . . 04539-500 500 mg
04539-5 5 g

(3,6-Bis[dimethylamino]acridine hydrochloride hydrate) MW 301.83

DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Free of inorganic salts. A specific stain for RNA, used as a 2% solution containing 1% lanthanum acetate in 15% acetic acid. λ max 494 ± 4nm

J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001); J. Lab Med., 15(3), 180 (1984)

2% Acridine Orange, Ready-to-Use [65-61-2] *HU5d* . . . . . 24603-10 10 ml

Ultrapure DNA intercalating dye. A grade of acridine orange of exceptionally high purity, suitable for quantitative work. Ready-to-use and free of inorganic salts. A specific stain for RNA, used as a 2% solution. Ready-to-use format eliminates the exposure to potentially irritating powdered dyes.

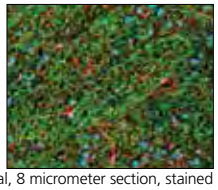
J. Histochem. Cytochem., 22, 495 (1974); 31, 737 (1983); 44, 393 (1996); 49, 921 (2001) J. Lab Med., 15(3), 180 (1984)

Bisbenzimide (Hoechst 33258) [23491-45-4] *H4abd* . . . . . 09460-100 100 mg

(2'-[4-Hydroxyphenyl]-5-[4-methyl-1-piperazinyl]-2,5'-bi-1H-benzimidazole trihydrochloride pentahydrate; Hoechst 33258) MW 623.97 $C_{27}H_{37}Cl_3N_6O_4$

Fluorescent chromosome stain. Recommended use is 10mg/ml for 2 – 10 minutes. This will vary based on section thickness.

Science, 220, 620 (1983), Anal. Biochem., 179, 401 (1989)



Rat Brain Sagittal, 8 micrometer section, stained with Hoechst 33342, Alexa Fluor 568-6FAP (Rb) and Alexa Fluor 488-NF-P (Ms). Photo: Mike Davidson of Florida State University

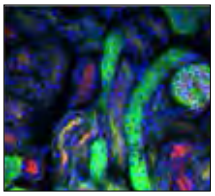
Molecular Biology

	Catalog #	Size
Cuprolinic blue (Quinolinic phthalocyanine) [41276-95-3] *U7ad*	17052-100	100 mg
	17052-500	500 mg

MW 1,084.54
Intensely blue cationic dye used for the visualization of RNA and other polynucleotides. Stain (microwave) used for enteric neurons. Can also used as a counterstain in immunoperoxidase procedures.
Histochem. J., 15, 801 (1983); 15, 1113 (1983); Biotechniques, 7, 692 (1989)

	Catalog #	Size
4',6-Diamidino-2-phenylindole dihydrochloride (DAPI) [28718-90-3] *U3acd*	09224-10	10 mg
	09224-50	50 mg

MW 350.25
A cationic fluorescent dye which specifically binds to adenine-thymine-rich DNA. Applications include detection of nanogram quantities of DNA in cellular homogenates, and cytofluorometric determination of the DNA base content in human chromosomes. *Available in bulk quantities for OEM users at significant savings.* λ max: 342nm Technical Data Sheet #444
Nature, 253, 461 (1975); Anal. Biochem., 92, 497 (1979); Stain Technol., 60, 7 (1985); Eur. J. Biochem., 182, 437 (1989)



Mouse Kidney cells were stained with DAPI, Alexa Fluor® 488 wheat germ agglutinin, Alexa Fluor® 568 phalloidin. Contributed by Walt Metcalfe, Molecular Probes, Inc.; photographed by Gregg Jarvis, Omega Optical, Inc.

	Catalog #	Size
Hydroethidine™ (Dihydroethidium bromide) [104821-25-2] *HU5cd*	17084-50	50 mg

MW 315.5 mp 202 – 206°
Reduced ethidium bromide. A vital stain. Enters and stains living cells without cellular trauma. Double staining system. Stains cytoplasm blue and chromatin red. Excellent cellular retention. Remains incorporated in chromatin with virtually no leakage. Essentially non-toxic. Shows no toxicity at levels useful for visualizing chromatin. Em. max: 420nm Ex. max: 365nm Technical Data Sheet #351
Biotechnology, 3, 4 (1985)

	Catalog #	Size
Lissamine Rhodamine B sulfonyl chloride, ~99% [62796-29-6] *H3g*	08074-100	100 mg

MW 577.1
Fluorescent protein stain with bright orange fluorescence. Used to visualize actin filaments in living amoebas. Useful for waste water testing and various microbiological applications.
J. Cell. Biol. 86, 590 (1980)

	Catalog #	Size
Mithramycin [18378-89-7] *VWX7f*	09330-5	5 mg

(Plicamycin; Aureolic acid; Mithracin) MW 1,085.18 mp 180 – 183°
Fluorescent DNA dye.
Stain Technol., 60, 145 (1985); Merck Index 11, 7510

	Catalog #	Size
Naphthalene-2,3-dicarboxaldehyde [7149-49-7] *HY4g*	21486-100	100 mg

MW 184.19 mp 131 – 133°
Highly Purified Grade-single spot TLC Fluorogenic derivatizing agent for amines. Useful for fluorescent determination of serum arginine and for trace amino acid and peptide analysis.

	Catalog #	Size
Nitroblue tetrazolium chloride (NBT) [298-83-9] *HU6ae*	00928-500	500 mg
	00928-1	1 g

MW 817.65 mp 215 – 217°
Used for estimating dehydrogenases and other oxidases. Also used in the detection of nucleic acid hybridization and in the detection of ascorbate peroxidase activity in native gels. Totally soluble and formazan free.
Methods Enzymol., 6, 958 (1963); Anal. Biochem., 56, 353 (1973); 212, 540 (1993), J. Clin. Lab. Anal., 7, 174 (1993)

	Catalog #	Size
Osmium ammine-B [48016-91-7] *U5g*	21033-100	100 mg

Stable DNA stain.
J. Histochem. Cytochem., 37, 395 (1989)

	Catalog #	Size
Propidium iodide [25535-16-4] *HVWX6g*	03748-100	100 mg

MW 668.41 mp 220 - 225°
Fluorescent marker. Used as a nuclear counterstain and for In situ Hybridization (ISH).
λ max: 493nm
J. Histochem. Cytochem., 35, 123 (1987)

Molecular Biology

	Catalog #	Size
Rhodamine B isothiocyanate, mixture of isomers [36877-69-7] *U5g* . . . . . MW 536.1 Fluorescent marker for proteins. Also used as a counterstain in conjunction with FITC. *J. Bacteriol., 83, 1358 (1962); Arch. Biochem. Biophys., 133, 263 (1969)*	00374-250	250 mg
Toluidine Blue O, C.I. 52040, certified [92-31-9] *U5g* . . . . . MW 305.83 A metachromatic, cationic thiazine dye that is widely used in in vitro biological applications. Also used in techniques for DNAase detection. λ max: 626nm *Stain Technol., 18, 35 (1943); 38, 281 (1963); J. Clin. Microbiol., 21, 195 (1985); Arch. Surg., 95, 16 (1967)*	01234-25	25 g
Toluidine Blue O, C.I. 52040, purified [92-31-9] *U5g* . . . . . MW 305.83 Useful for staining RNA, oligodeoxynucleotides, proteins and glycosaminoglycans, skin lesion for Mohs. λ max: 626nm *Nature, 213, 1133 (1967); Anal. Biochem., 46, 156 (1972)*	15931-10	10 g

General Reagents

Guanidine Isothiocyanate Solution, 4M [593-84-0] . . . . . $NH_2C(=NH)NH_2$ • HSCN Used in purification of RNA. *Beilstein Registry #3563461*	25070-500	500 ml
Guanidine Isothiocyanate, Ultrapure [593-84-0] . . . . . CH_5N_3 • HSCN • H_2O Purity: 99.0% pH: (1M in water) 5.0-7.0 Used to isolate RNA from sources like pancreas and high molecular DNA from procaryotic organisms that require strong enzyme detergent lysis and organic treatment. Strong protein denaturant when used in high concentrations.	25071-500	500 g

Probes

Amine Terminated Polymer Coated Nanoparticles

15nm	24876-1	1 ml
20nm	24877-1	1 ml
30nm	24878-1	1 ml

Carboxyl Terminated Polymer Coated Nanoparticles

15nm	24870-1	1 ml
20nm	24871-1	1 ml
30nm	24872-1	1 ml

Methyl Terminated Polymer Coated Nanoparticles

15nm	24879-1	1 ml
20nm	24880-1	1 ml
30nm	24881-1	1 ml

Neutravidin Terminated Polymer Coated Nanoparticles

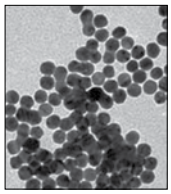
15nm	24873-1	1 ml
20nm	24874-1	1 ml
30nm	24875-1	1 ml

Molecular Biology

	Catalog #	Size
Mercaptyalkyl PEG Gold Nanoparticles	24688-5	5 ml

Nanoparticle conjugate. Technical Data Sheet #787

A.G. Kanaras, F.S. Kamounah, K. Schaumburg, C.J. Kiely, M. Brust. Thioalkylated tetraethylene glycol: a new ligand for water soluble monolayer protected gold clusters. Chem. Comm. 2002, 20, 2294.



Naked Gold Nanoparticles *CH4g*	24689-5	5 ml

5 – 8nm bare gold nanoparticles in toluene stabilized by loosely adsorbed tetraoctylammonium bromide.

M. Brust, D. Bethell, D.J. Schiffrin, C. Kiely. Novel Gold-Dithiol Nano-Networks with Non-metallic Electronic Properties. Adv. Mater. 1995, 7, 795. M. Brust, D. Bethell, C. J. Kiely, D. J. Schiffrin. Self-Assembled Gold Nanoparticle Thin Films with Non-M

Chloroauric acid [16961-25-4] *H5bd*	00395-1	1 g

MW 393.8 d 3.90

Used for production of colloidal gold solutions.

Colloidal Gold Solution, 0.005%, 15-25nm *U2w*	09285-50	50 ml

Colloidal gold has been widely used to make bioconjugate probes for labeling and visualizing biologic specimens via light and electron microscopy. Most proteins can be easily coupled to colloidal gold particles with retention of the bound protein's biological activity.
Technical Data Sheet #787

Unconjugated gold colloid (GC) *A2dmw*

PolyGold reagents are of the highest quality and can be relied upon to give reproducible results. For TEM studies, the most convenient sizes of gold particles are 5nm, 10nm and 15nm. The long shelf life (12 months when stored at 4° C) makes the use of these reagents economical. Resolution of most SEMs is such that immunolabeling studies require either the use of larger sized gold particles or enhancement of smaller gold particles using silver enhancement (deposition) technology. Accordingly, the gold colloids listed below include 20nm, 30nm and 40nm particles for direct visualization in the SEM.

Benefits:

- High specificity
- Low clustering – agglomeration of gold particles is minimal, over 85% of particles being singlets
- Discrete particle sizing – narrow particle size distribution allows double labeling to be achieved

10nm	22717-100	100 ml
15nm	22718-100	100 ml
20nm	22719-100	100 ml
40nm	22720-100	100 ml
5nm	22716-100	100 ml
60nm	22703-100	100 ml

Gel Electrophoresis

Acrylamide, Chemzymes Ultra Pure® [79-06-1] *HMO6d*	00019-100	100 g
	00019-500	500 g

MW 71.08 mp 84-85° uninhibited 165° TSCA $H_2C{=}CHCONH_2$

Specific conductance of 35% (w/v) solution 2μmho/cm. Used in electrophoresis for separation of nucleic acid fragments and proteins. For introduction of hydrophilic sites, preparation of water-soluble polymers and in electrophoresis. Technical Data Sheet #155

Molecular Biology

	Catalog #	Size
Acrylamide/Bis (Pre-mixed Powder) *HMO6d*		
(19:1)	17452-6	6 x 30 g
(29:1)	19847-30	30 g
	19847-6	6 x 30 g
(37.5:1)	17451-30	30 g
	17451-6	6 x 30 g
Agarose, Molecular Biology Grade *A2g*	23689-50	50 g
	23689-100	100 g
ElectroPure™ Silver Stain Kit *BHMV7g*	16717-1	1 kit
Ethidium bromide [1239-45-8] *H5g*	04033-5	5 g

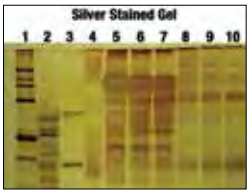
Acrylamide/Bis (Pre-mixed Powder) *HMO6d*
The convenience and safety of premixed acrylamide and methylenebisacrylamide is now available with Polysciences' high quality standards. Acrylamide *(Cat. #00019)* and N,N'-methylene bisacrylamide *(Cat. #00719)* are combined in a readily soluble form in exact proportions. Each batch is pretested. Each unit (bottle) contains 30 grams of solids. Add deoinized water to the graduated bottle to make 100ml or 30% stock solution and store for 1 month at 4° C. No handling of toxic powders required. 30% (wt./vol.) acrylamide/bisacrylamide.
Technical Data Sheet #479

Agarose, Molecular Biology Grade *A2g*
Agarose is a natural complex polysaccharide isolated from agar or agar-bearing marine algae. It forms a clear gel matrix that is very useful for electrophoresis, immuno-electrophoresis and immunodiffusion. It is ideally suited for electrophoretic separation of proteins and nucleic acids and for PCR product analysis.

Applications:

- DNA restriction fragment separation
- PCR product separation
- Southern and Northern blotting
- Pulsed field electrophoresis
- Immunoelectrophoresis
- Laurell rocket
- Immunodiffusion
- Protein electrophoresis
- Gelling temp. 35 – 40° C
- Melting temp. 86 – 90° C
- Sulfate content Gel strength >1000 g/cm^2 (1%)

ElectroPure™ Silver Stain Kit *BHMV7g*
Silver staining is a highly sensitive method for detecting proteins in polyacrylamide slab gels. Most silver staining protocols are time consuming, complicated, and dependent upon the purity of the reagents. Polysciences' Silver Stain Kit is simple, stable, controllable, and very rapid. Our method is sensitive to proteins in the nanogram range and may be used either before or after Coomassie blue staining. Staining for proteins is initiated in an alkali environment. Protein amino groups as well as cysteine and methionine sulfur groups are complexed with silver cations. Technical Data Sheet #293



Gel stained with Silver Stain Kit.

Kit Contains:

- Sodium Hydroxide, Formaldehyde, Ammonium Hydroxide, Silver Nitrate and Citric acid

Ethidium bromide [1239-45-8] *H5g*
(Homidium bromide; 3,8-Diamino-5-ethyl-6-phenylphenanthridium bromide;2,7-diamino-10-ethyl-9-phenylphenanthridium bromide) MW 394.32 mp 260 – 262° (dec.)
Intercalates double-stranded nucleic acids; frameshift mutagen; fluorescent stain for nucleic acids in electrophoresis; used for DNA quantitation.
J. Mol. Biol., 47, 419 (1970); Ann. Rev. Biochem., 44, 273 (1975); Dev. Biol., 108, 325 (1985)

Molecular Biology

	Catalog #	Size
Glycerol, USP (Glycerine) [56-81-5] *A2g*	00084-100	100 g
	00084-1	1000 g

MW 92.09 bp 182°/20mm
Used as cryoprotectant to help prevent ice crystal damage to specimens. Substrate for the assay of glycerol dehydrogenase, glycerol oxidase, and glycerokinase.
Methods Enzymol., 1, 397 (1955); 42, 148 (1975); 89, 243 (1982)

N,N'-Methylenebisacrylamide, Chemzymes®; Ultra Pure, Purity >99% [110-26-9] *HV6d*	00719-25	25 g
	00719-100	100 g

MW 154.17 mp 300° TSCA $(H_2C{=}CHCONH)_2CH_2$
High purity crosslinking monomer used for precision PAGE. Also suitable for UV scanning gels. Crosslinking monomer used especially with acrylamide. Purity >99% Conductivity of 2% soln/ <5mmho Technical Data Sheet #479

N,N,N',N'-Tetramethylethylenediamine, Chemzymes Ultra Pure® (TEMED) [110-18-9] *BCH6g*	08036-10	10 x 5 ml

MW 116.21 bp 120 – 122°
Polymerization accelerator with ammonium persulfate or riboflavin initiation. Supplied in N2 sealed ampoules.
Anal. Biochem., 35, 533 (1970); 74, 620 (1976)

PolyPAGE-40 Acrylamide/Bis Liquid Solutions *HMO6d*
By varying the monomer (acrylamide) and crosslinker (bisacrylamide) concentrations in a polyacrylamide gel, one can optimize the pore size of the gel to give the best separation and resolution for your specific molecule. Polysciences offers the following convenient ready to use liquid formulations. Each PolyPAGE-40 product is specially produced to ensure maximum stability and shelf life and is guaranteed for 3 years.

19:1 solution	24170-100	100 ml
	24170-6	6 x 100 ml
29:1 solution	24169-100	100 ml
	24169-6	6 x 100 ml

Stains-all [7423-31-6] *H5g*	03943-1	1 g
	03943-5	5 g

(1-Ethyl-2-[3-(1-ethylnaphtho[1,2-d]thiazolin-2-ylidene)-2-methylpropenyl]naphtho[1,2-d]thiazolium bromide, 3,3'-Diethyl-9-methyl-4,5,4',5'-dibenzothiacarbocyanine) MW 559.6 $C_{30}H_{27}BrN_2S_2$
Stains proteins red, DNA blue, and RNA bluish-purple. Also useful for staining acid polysaccharides.
Biochim. Biophys. Acta, 264, 73 (1972); Anal. Biochem., 29, 421 (1969); 56, 43 (1973); J. Histochem. Cytochem., 22, 1169 (1974)

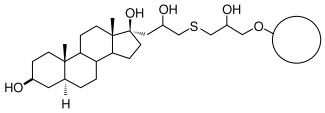
Trichloroacetic acid, 98% [76-03-9] *BK4d*	01241-250	250 g

Protein precipitant and fixative. Used in fixing solutions for PAGE and IEF gels.

Affinity Chromatography

Androstan Sepharose® 6B Novel Immobilized Steroid Beads *CH7d*	24858-1	1 ml

Typical ligand loading 10 – 14 μmoles/mL bead.

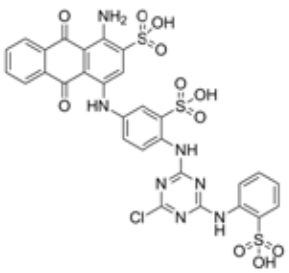


Molecular Biology

	Catalog #	Size
New! Cibacron Blue, F3GA, C.I. 61211, Affinity Chromatography Grade [12236-82-7] *U5g* (Reactive Blue 2) MW 774.16	25721-1	1 g
	25721-5	5 g
	25721-100	100 g

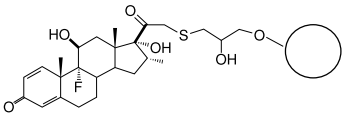
Sulfonated triazine dye that can be immobilized on a support matrix and used for affinity chromatography of proteins. Also used for probing nucleotide binding sites in proteins. 1H NMR and mass spectrometry data are consistent with the structure shown. *Meta and para sulfonic acid F-ring isomers available on request. Call for quote.* Appearance: Powder

Methods Enzymol., 80, 754 (1981); Biochem. Biophys. Res.



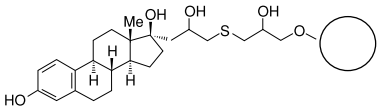
Dexamethasone Sepharose® 6B Novel Immobilized Steroid Beads *CH7d* ..... 24859-1 — 1 ml

Typical ligand loading 10 – 14 µmoles/mL bead.



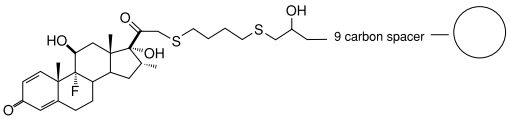
Estradiol Sepharose® 6B Novel Immobilized Steroid Beads *CH7d* ..... 24861-1 — 1 ml

Typical ligand loading 10 – 14 µmoles/mL bead.



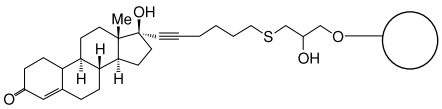
Long Spacer Arm Dexamethasone Sepharose® 6B Novel Immobilized Steroid Beads *CHU4d* 24869-1 — 1 ml

Typical ligand loading 10 – 14 µmoles/mL bead.



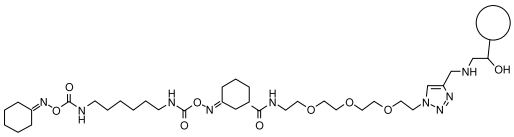
Nortestosterone Sepharose® 6B Novel Immobilized Steroid Beads *CH7d* ..... 24860-1 — 1 ml

Typical ligand loading 10 – 14 µmoles/mL bead.



RHC-80267 (U-57908) Sepharose® 6B Novel Immobilized Steroid Beads *CHU4d* ..... 24868-1 — 1 ml

Typical ligand loading 12 – 15 µmoles/mL bead. Use to purify diacylglycerol (DAG) lipases.



Microscope Slides

Tissue Tack™ Microscope Slides – Plus (+) Glass ..... 24216-1 — 72 slides

Treated with a specially formulated aminoalkylsilane, Tissue Tack slides provide a positively charged surface, which permits instant coupling of negatively charged tissue sections. The resultant bond stands up to the very aggressive solutions used in In-Situ Hybridization procedures. Slides are available with a white label. Technical Data Sheet #518

Enzymes

Animal Origin-Free Collagenases

	Catalog #	Size
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type A . . . . . Collagenase drived from cultures grown in animal-free medium. Suitable for applications needing to avoid introduction of potential animal derived pathogens into bioprocessing procedures.	25606-100	100 mg
	25606-1	1 gm
	25606-5	5 gm
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type A, 0.22 Filtered . . . . . Collagenase, Animal Origin-Free which is filtered through a 0.22 micron membrane and lyopholized in vials.	25607-50	50 mg
	25607-5	5 x 50 mg
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type B . . . . . Prepared from cultures grown in medium completely devoid of animal based components and designed for bioprocessing applications where introduction of animal derived pathogens must be prevented.	25608-100	100 mg
	25608-1	1 gm
	25608-5	5 gm
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type B, 0.22 Filtered . . . . . Collagenase, Animal Origin-Free which is filtered through a 0.22 micron membrane and lyopholized in vials.	25609-50	50 mg
	25609-5	5 x 50 mg
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type C *H23d* . . . . . Prepared from cultures grown in medium completely devoid of animal based components and designed for bioprocessing applications where introduction of animal derived pathogens must be prevented.	25610-100	100 mg
	25610-1	1 gm
	25610-5	5 gm
Chemzymes Ultra Pure® Collagenase, Animal Origin-Free, Type C, 0.22 Filtered . . . . . Collagenase, Animal Origin-Free which is filtered through a 0.22 micron membrane and lyopholized in vials.	25611-50	50 mg
	25611-5	5 x 50 mg
Chemzymes Ultra Pure®, 250 Collagenase / 1,000 Neutral Protease, 0.22 Filtered . . . . A specialized combination of Animal Origin-Free *Clostridium histolyticum* collagenase and Animal Origin-Free *Bacillus polymyxa* neutral protease with a minimum of 250 CLS units and 1,000 caseinase units per mg dry weight. Designed for stem cell and other primary cell isolations and bioprocessing applications where introduction of potential animal derived pathogens must be prevented.	25612-50	50 mg
	25612-5	5 x 50 mg
Chemzymes Ultra Pure®, 250 Collagenase / 2,000 Neutral Protease, 0.22 Filtered . . . . A specialized combination of Animal Origin-Free *Clostridium histolyticum* collagenase and Animal Origin-Free *Bacillus polymyxa* neutral protease with a minimum of 250 CLS units and 2,000 caseinase units per mg dry weight. Designed for stem cell and other primary cell isolations and bioprocessing applications where introduction of potential animal derived pathogens must be prevented.	25613-50	50 mg
	25613-5	5 x 50 mg

Proteases for Tissue Dissociation and Protein Digestion

Chemzymes Ultra Pure® Elastase, Purified . . . . . Chromatographically purified. Lyophilized powder. Requires cold pack for shipping.	25619-5	5 mg
	25619-20	20 mg
Chemzymes Ultra Pure® Neutral Protease (Dispase®), Animal Origin Free . . . . . Chromatographically purified. Lyophilized powder.	25620-10	10 mg
	25620-50	50 mg
Chemzymes Ultra Pure® Papain, Lyophilized . . . . . Supplied as a lyophilized powder prepared from a 2X crystalline suspension.	25621-25	25 mg
	25621-100	100 mg
	25621-1	1 gm
Chemzymes Ultra Pure® Pepsin A . . . . . Two times crystallized from dilute alcohol. Lyophilized powder.	25622-1	1 gm
	25622-10	10 gm
Chemzymes Ultra Pure® Proteinase K . . . . . A lyophilized powder. Purified to remove Dnase and Rnase.	25623-25	25 mg
	25623-100	100 mg
	25623-1	1 gm

Enzymes

	Catalog #	Size
Chemzymes Ultra Pure® Trypsin, TPCK Treated A chromatographically purified, diafiltered, lyophilized powder that has been treated with TPCK to inhibit contaminating chymotryptic activity.	25624-100	100 mg
	25624-500	500 mg
	25624-1	1 gm
Chemzymes Ultra Pure® Trypsin, 0.22u Filtered Trypsin chromatographically purified, diafiltered, filtered through a 0.22 micron pore size membrane and lyophilized in sterile vials. This product is not tested for pyrogenicity.	25625-50	50 mg
	25625-5	5 x 50 mg
Chemzymes Ultra Pure® Chymotrypsin, Alpha, TLCK Treated for Sequencing TLCK treated to inhibit any contaminating trypsin activity. Lyophilized powder.	25618-25	4 x 25 ug
	25618-100	4 x 100 ug

Sequencing Proteins

Chemzymes Ultra Pure® Modified Trypsin for Sequencing TPCK-treated trypsin chemically modified to reduce autolysis and increase stability while retaining its specificity. Supplied as a lyophilized powder. Exhibits a single band on SDS-PAGE.	25614-25	4 x 25 ug
	25614-100	4 x 100 ug
	25614-1	1 mg
Chemzymes Ultra Pure® Purified Trypsin for Sequencing Chromatographically purified, treated with TPCK to inhibit chymotryptic activity.	25615-25	4 x 25 ug
	25615-100	4 x 100 ug
	25615-1	1 mg
Chemzymes Ultra Pure® Protease, *Staph aureus* (Endoproteinase Glu-C) for Sequencing Sequencing grade Staph V8 Protease. Chromatographically purified and dialyzed lyophilized powder.	25616-10	5 x 10 ug
	25616-50	5 x 50 ug
Chemzymes Ultra Pure® Clostripain (Endoproteinase-Arg-C) for Sequencing Chromatographically purified, dialyzed and pre-activated lyophilized powder.	25617-10	10 ug

NeuroScience

Dyes & Stains

Amyloid Stain Kit (Congo Red) Complete kit to aid in the staining of tissue for Amyloidosis. Used in the detection of amyloid FFPE as well as frozen tissue sections cut at 10 microns. The amyloid stains red and the nuclei stains blue. Control tissue is Alzheimer's or other known amyloidosis.	24614-1	1 kit
New! **Bielschowsky's Stain** Silver stain used to demonstrate the presence of senile plaques and neurofibrillary tangles in Alzheimer's disease. Used on FFPE sections cut at 8-10 microns. Senile plaques, neurofibrillary tangles and axons stain dark brown to black.	25994-250	250 ml
	25994-500	500 ml
Cresyl Violet Acetate, certified [10510-54-0] *U5g* (9-Amino-5-imino-5H-benzo[a]phenoxazine acetate salt) MW 321.34 mp 140-143° Useful for staining Nissl substances in nerve cells and for bulk staining of nerve tissue.	21063-10	10 g
Dextran, FITC [60842-46-8] *A2g* (Fluorescein isothiocyanate) MW 150,000 Valuable materials for studying permeability and microcirculation in vivo. These are used to trace neuronal projections and active transport in live and unfixed tissue and as neuronal tracers in a variety of species. Appearance: Yellow-orange crystalline powder *J. Jonsson et al, 6th Europ. Conf. Microcirculation, Aalbong 1970, 214. Microvascular Res., 3, 440, (1971); Trends Nerosci, 13, 14 (1990); Proc. Natl. Acad. Sci. USA 92, 11500 (1995); Acla Neuropath. 59, 63, (1983). Cole, L., et al., J. Cell. Sci., v. 96, 721 (1990) [Internalisation of FITC and FITC-dextran by suspension cultured plant cells], Oliver, J.M., et al., Meths. Enzymol., v. 108, 336 (1984) [Study of fluid pinocytosis in leukocytes]*	15759-500	500 mg

NeuroScience

	Catalog #	Size
Fast Blue [74749-42-1] *U7g*	17740-1	1 mg
	17740-2	2 mg
	17740-5	5 mg

Soluble in water, lower alcohols.
Fluorescent dye commonly used as a neuronal tracer and referred to as a hydrophilic retrograde tracer. Fast Blue can be used alone or with other types of fluorescent retrograde and anterograde tracer dyes. Other neuronal tracers such as True Blue, Evans Blue and Nuclear Yellow are commonly used in conjunction with Fast Blue.
Adv. Cell. Neurobiol., 5, 307 (1984); J. Anat. Soc. India 48(2) 67-72-1999

Luxol Fast Blue, Ready-to-Use *CH4g*	24611-500	500 ml

Used to stain myelin and phospholipids.

NeuroVue® Filter Squares For Neuronal Tract Tracing
NeuroVue® Dye Filters are useful tools in several different areas of research including neuronal tract tracing studies of up to 3 – 4 weeks and are spectrally compatible with most fluorescent light-absorbing tags. Technical Data Sheet #771

Monitoring diffusion distance using NeuroVue® dye absorbance in murine head (lateral view) embryonic day 12.5

Features:

- Convenient, ready-to-use coated filter format
- More precise control of dye insertion point
- No messy oils, pastes or hard-to-position crystals
- Diffusion properties comparable to or better than other commercially available neurotracing dyes
- More focal results (e.g. labeling of small sets of axons within pathway)
- Available in multiple colors, including far red, for multi-tract tracing and improved results even in tissues with high myelin expression

Burgundy	Em. Max 707nm	Ex. Max 683nm	24838-1	1 filter
Jade	Em. Max 507nm	Ex. Max 494nm	24837-1	1 filter
New! Jade Solid	Em. Max 508nm	Ex. Max 478nm	25687-1	1 mg
Maroon	Em. Max 667nm	Ex. Max 687nm	24834-1	1 filter
Maroon Solid	Em. Max 667nm	Ex. Max 647nm	25569-1	1 mg
Orange	Em. Max 570nm	Ex. Max 550nm	24836-1	1 filter
Red	Em. Max 588nm	Ex. Max 567nm	24835-1	1 filter
Red Plus	Em. Max 588nm	Ex. Max 567nm	24906-1	1 filter
Red Solid	Em. Max 588nm	Ex. Max 567nm	24907-1	1 mg

Enzymes

Neuron specific enolase *A2d*
A unique form of the glycolytic enzyme enolase (E.C.4.2.1.11) found in neurons and in virtually all of the neuroendocrine, paraneuronal cell types. Certain neurological disorders are accompanied by increases in serum and spinal fluid NSE levels. NSE is also found in high concentrations in neuroendocrine tumors. Levels of NSE in biological fluids can be useful parameter for the assessment of neural tissue damage in the brain. Our human NSE and rat NSE have a specific activity of 40-60 units per mg. Both can be used in conjunction with anti-human NSE or anti-rat NSE to formulate an RIA to measure NSE levels in tissue, serum or spinal fluid. Technical Data Sheet #314

Human, lyophilized, purity >99%	17436-50	50 µg
Rat, lyophilized, purity >99%	17435A-50	50 µg

General Lab Supplies

	Catalog #	Size
BactiStop Antiseptic Hand Gel *C2g*	24116-1	6 x 120 ml

Unique anti-bacterial sanitizing gel designed for waterless hand washing. Pleasant scent with no harsh alcohol odor and contains Vitamin E and Aloe to leave your hands silky smooth.

BactiStop Hand Soap *A2g*	24008-1	1 liter
	24008-6	6 x 16 oz
	24008-12	12 x 1 liter

Pleasant smelling, non-drying, liquid hand soap. Great for use in your laboratory or in your home. Technical Data Sheet #519

Benefits:

- Ideal for frequent hand washings
- Convenient pump bottle with an easy-to-use active dispenser

Brush, Red Sable, Size 00000	08411-1	1 brush

Fine brush for manipulating samples or cleaning delicate items. Natural fiber tip tip is 1cm long and 2mm thick. Total brush length 17.5 cm.

Contrad® 70, soak cleaner from Decon Laboratories *H5g*	18417-5	5 liters
	18417-4	4 x 5 liters

A top quality soak cleaner for high grade cleaning of all labware. Alkaline. Phosphate free. Particularly recommended for analytical techniques, tissue culture, RIA, electrophoresis—any application where total cleanliness is essential. Safer replacement for chromic acid.

Glass Tubes with Plastic Snap Caps (specimen bottles)	02707-50	50 tubes

3.7ml capacity. 44mm in height x 13mm wide.

Gloves, latex, powder free

Made of natural latex with a high elasticity and a smooth, comfortable fit. Non-sterile, will fit either hand. Each box contains 100 gloves.

Large	24018-1	1 box
Medium	24017-1	1 box

Gloves, nitrile, powder free (Medium)	24023-1	1 box

Hypoallergenic; they are 100% Nitrile, a special polymer that does not contain rubber allergens. They are more puncture resistant than natural latex with excellent tactile sensitivity. Each box contains 100 gloves.

Gloves, nylon, lint free

Finest quality nylon, anti-static, for clean room work. Also when handling microscope lenses, slides or photos. Absorbs perspiration; washable and reusable. Box contains 12 pairs.

Men's Large	24020-1	1 box
Women's Large	24019-1	1 box

General Lab Supplies

	Catalog #	Size
LabPro™ Lens Cleaning Towelettes - *H4g*	24400-1	1 box

The "clear choice for plastic and glass lens cleaning." Professionally formulated with a unique anti-static solution that leaves lenses clean and clear. Eliminates the problem of impaired vision from dirt, fog and oily residue that does not come off with regular wiping. Easy to use dispensing box allows for quick and easy access. Towelettes are small enough to fit in your pocket to clean lenses anytime, anywhere. LabPro Professional Lens Cleaning Towelettes are safe, effective and ready when you need them. Manufactured in the USA. Each box contains 100 pre-moistened lens cleaning towelettes packaged in a 2" x 2.25" foil packet.

LabPro™ Nail & Cuticle Balm	24401-1	.30 oz / 8.5 g

Professionally formulated 100% natural nail & cuticle balm, developed to soothe and restore your hardworking hands and nails. Our nail & cuticle balm will bring restorative relief from the harsh effects experienced in today's work environment. Relentless exposure to soaps, detergents, water and paper take their toll on your hands. Restore moisture to your nails and cuticles with our 100% natural, nourishing, lightweight formula. Contains no petroleum chemicals. Not tested on animals. Fragrance: Almond

Lens Tissue, Ross	00791-1	1 box
	00791-5	5 boxes

Non-linting, fiberless, non-abrasive lens tissue. This specially prepared lens tissue is great for EM and LM applications. Also works well for eyeglasses.

Plastic weighing dish	19803A-1	1 carton
	19803B-1	1 case

This is our Peel-A-Way® weighing "tray" designed for easy pouring. These handy little dishes can be used for all sorts of applications in the laboratory in addition to their intended use of weighing materials.
Technical Data Sheet #433

PolyGlove Professional Hand Cream *A2g*	24007-1	16 oz
	24007-6	6 x 16 oz

Non-greasy, professional hand cream is a "latex-safe" product designed for use on hardworking, gloved hands. Absorbs instantly into hands to provide moisture and comfort.

PROMASTER® Lens Cleaning Pen	24316-1	1 pen

Handy lens cleaning tool removes fingerprints, smudges, and grease marks with ease and is compact enough to fit in your pocket!

PROMASTER® MicroClean Cleaning Cloth	24317-1	1 cloth

A special high-density treated fabric that absorbs oils and easily removes fingerprints, dust, and other particles from delicate lens and LCD surfaces, leaving them sparkling clean and clear. The MicroClean cloth is safe for use on all coated optical surfaces as well as glass, polycarbonate, and LCD surfaces. **Dimensions:** Machine Washable, 8" x 8"

General Lab Supplies

	Catalog #	Size
Push-Up Box for Kimwipes®	25030-1	1 each

Save time and money with perfect tissue dispensing down to the very last tissue. Kimwipes® pop up to the last tissue, one tissue at a time. *Kimwipes® not included*.

Benefits:

- Reduce waste in the lab or work area
- No digging required – unique design prevents tissues from falling back into box
- Accessible and portable – fits anywhere
- Durable, high impact polystyrene

Beakers

Beakers, Disposable
Package of 100 graduated polypropylene beakers designed for dripless pouring.

100 ml	07451-1	100/pk
250 ml	07452-1	100/pk
50 ml	07450-1	100/pk

Parafilm

Parafilm Dispenser for 2" and 4" rolls.	22398-1	1 unit

Parafilm molds quickly and seals laboratory vessels with a disposable, translucent film.

Parafilm
Used for sealing or protecting vessels such as flasks or cuvettes. Molds quickly and seals laboratory vessels with a disposable translucent film. Parafilm is stretchable, moldable, waterproof, odorless, thermoplastic and self-adhering. Can also be used to further seal a lidded container against moisture for long term storage.

2" x 250' Roll	3989C-1	1 roll
4" x 250' Roll	3989A-1	1 roll

Pens

Coat Quick "G" Pen	25466-1	1 pen

Provides thin layer of adherent coating onto grid surface. Dries in just two minutes at room temperature. Effective as a pre-treatment prior to application of supporting films such as formvar, collodion and other delicate membranes by acting as a barrier to further tearing of the thin membrane or support film. Excellent adjunct for specimen retrieval techniques with TEM grids.

Conducting Silver Pen	23304-1	1 pen

Great for adhering samples to SEM stubs. Designed for making instant conductive silver traces, the specially formulated silver-bearing thermoplastic polymer dries in minutes at room temperature. Valved pen tip allows smooth flow with normal writing pressure and is spring loaded to prevent clogging. Can use Butyl Acetate as a thinner.

General Lab Supplies

	Catalog #	Size
Frozen Tissue Pen Designed to prevent frozen sections from falling or lifting off, moving or wrinkling on the slide during routine and or immunostaining procedures. Provides a sticky membrane when applied to slide onto which the section is placed. Membrane is stable up to 110° C and is suitable for vigorous subsequent applications such as in situ hybridization. Can be effective with PAP/PAAP, ABC, LAB-SA and immunofluorescent methods.	25469-1	1 pen
Marker, Secureline *A2g* Virtually permanent ink resists even the harshest solvents including alcohol and xylene. Perfect marker for labeling embedded blocks, tissue cassettes and painted or frosted slides.	21947-1	1 pen
Paraffin Tissue Pen Creates a sticky coating designed to prevent paraffin-embedded tissue sections from falling off, moving, or wrinkling on the slide during immunohistochemistry procedures. Flattens sections at room temperature, avoiding the need to extend them in hot water prior to application. Can be used with PAP liquid blocker pens. Coating is stable up to 120° C.	25470-1	1 pen
Super PAP Pen – Fine Tip, 2.5mm tip Fine tip version of our 4mm Super PAP Pen offers the same benefits with a 2.5mm tip for finer drawing. Provides over 400 applications.	24231-1	1 pen
Super PAP Pen, 4mm tip Provides a thin film-like barrier when a circle is drawn around a specimen. The hydrophobic circle is designed to withstand temperatures up to 120° C and can be applied directly to wet slides. This barrier creates the proper surface tension to hold antibody solution within the target area on a slide. Effective for immunology staining by PAP methods, ABC method, frozen section methods & fluorescent antibody methods. Provides over 800 applications. 4mm tapered tip.	24230-1	1 pen
Tissue Capture Pen Improves section attachment to glass slides during immunohistochemical staining. Creates sticky surface on glass slides ideally suited for paraffin or frozen section attachment. Greatly improves section adherence throughout long immunostaining protocols. Wide 18mm point. Dries in 1 – 2 minutes. Stable up to 110° C. Provides 3000 – 5000 applications.	25468-1	1 holder

Storage Units

Control Block File Holder Medical laboratories, research laboratories and hospitals will find the Control Block File Holder excellent for the storage of histological control blocks. Separate compartments allow blocks to be organized by researcher or tissue type. Constructed of a moisture and abrasive resistant exterior covering. Includes lid chart for rapid retrieval of control blocks. Compartment dimensions: 1.5 x 1 x 2.25 D Outside dimensions: 15.25 x 10.5 x 2.375	17317-1	100 each
Paraffin Block Mailer/Holder Convenient transport container for up to 6 paraffin blocks. Made of transparent PVC for easy viewing of contents. Suitable for all regular models of tissue and biopsy cassettes.	25340-25 25340-50	25 units 50/pk

General Lab Supplies

	Catalog #	Size
Storage Envelopes, Photographic		
Unprinted glassine (holds 3.25″ x 4.25″ neg.)	19484-500	500 env.
Unprinted glassine (holds 4″ x 5″ neg.)	19485-500	500 env.
Unprinted polyethylene (holds 3.25″ x 4.25″ neg. or plates)	07233-500	500 env.
Unprinted polyethylene (holds 4″ x 5″ neg. or plates)	07235-500	500 env.

Tape

Tape, Silver Coated, Polyester . . . . . 08419-1 — 1 roll
Used for making boats for glass knives. — 08419-10 — 10 rolls

Timers

Timer, 5 channel, pocket size, 100 hours (up or down) . . . . . 18956-1 — 1 unit

Five independent channels, count up or down for any interval from 1 second to 100 hours. Large display indicates channels in use. Each has 1 minute alarm. Automatically begins to count up to indicate time elapsed after count down reaches zero. Memory recalls last timer setting for reuse. Also has a clock mode. Includes: stand, pocket clip and magnet.

Dimensions: 2.7″ x 2.5″ x 0.5″ Weight: 2oz.

Timer, pocket size, 24 hours (up or down) . . . . . 21970-1 — 1 unit

Counts up or down from 1 second to 24 hours. Alarm memory, turns off automatically. Includes: clip, stand, magnet, and 1.5 volt battery. Dimensions, 2.5″ x 2.25″

Reference Books

Gram Stain: Looking Beyond Bacteria to Find Fungi in Gram Stained Smear: A laboratory guide for medical microbiology . . . . . 25043-1 — 1 book
By Subhash Kumar Mohan

Specifically designed for people working in the medical microbiology laboratory with little or no practical experience in medical mycology. The central idea presented in this textbook begins with the Gram stain for the detection of fungi; the most important and more frequently isolated opportunistic and potentially pathogenic fungal species have been included. Newly developed flowcharts, clues and key details regarding structural characteristics have been added to guide the reader in the right direction. The author has accumulated many scenarios in which fungal elements were not detected on the original Gram stain evaluation but were found to be positive upon review once the culture grew a fungus. The book also contains a chapter with a practice examination including microscopic images representative of scenarios commonly encountered in the clinical microbiology laboratory.

Manual of Immunoperoxidase Techniques . . . . . 17168A-1 — 1 book
By Robert J. Wordinges, Ginger W. Miller, and Donna S. Nicodemus

Photography Through the Microscope . . . . . 19692-1 — 1 book
By J.G. Delly (Kodak)

Reference Books

	Catalog #	Size
The Microwave Tool Book - A Practical Guide For Microscopists	23509-1	1 book

The Microwave Tool Book is the classic reference text for practical use of microwave processing in histology. Helpful with CAP Guidelines for microwaves in the laboratory. By G. R. Login, DMD & A.M. Dvorak, MD©1994

Features:

- 24 exercises, dozens of illustrations and several practical tips.
- Understand how your microwave works relative to laboratory procedures
- Learn how to calibrate and standardize lab microwave ovens
- Invaluable resource for students, technicians, teachers and researchers
- Includes lab exercises for learning the ins and outs of microwave technology

Waste Management Systems

DAB/Out™ Bench-Top System — 25064-1 — 1 unit

(Diaminobenzidine)

Chemically extracts diaminobenzidine from liquid waste generated in IHC staining. The liquid effluent passed through the DAB/Out™ cartridge can be safely poured down the drain. The replaceable cartridge, which has trapped the DAB, is disposable as a dry-solid hazardous waste. DAB/Out™ reduces exposure and eliminates neutralization procedures, while providing a cost effective and environmentally safe alternative to drain disposal.
System Includes: tower, stand, hand vacuum and 1 cartridge.

DAB/Out™ System Replacement Cartridges — 25065-1 — 6 cartridges

Replaceable cartridge, which has trapped the DAB, is disposable as a dry-solid hazardous waste. DAB/Out™ reduces exposure and eliminates neutralization procedures, while providing a cost effective and environmentally safe alternative to drain disposal.

FLUOR/Away™ Bench-Top System — 25068-1 — 1 unit

Extract Ethidium bromide and other fluorescent dyes from aqueous solutions, eliminating hazardous liquid waste. Reduces the potential for spills and reclaims valuable lab space.
System Includes: tower, stand, hand vacuum and 2 cartridges.

FLUOR/Away™ System Replacement Cartridges — 25069-1 — 6 cartridges

Replacement cartridges can process 20 liters of standard staining solution (0.5µg/ml EtBr) and have a maximum binding capacity of 10mg/cartridge.

RAD/Away™ Bench-Top System — 25066-1 — 1 unit

Chemically binds low-level radioactive molecules in liquid laboratory waste, concentrating them into small dry solid that can be sealed for disposal, decay or incineration. Provides an easy mechanism to maintain compliance, lowers waste management costs and limits radioactive material released into sewer systems.

System Includes: tower, stand, hand vacuum and 2 cartridges

RAD/Away™ System Replacement Cartridges — 25067-1 — 6 cartridges

Replaceable cartridge reduces exposure and eliminates neutralization procedures, while providing a cost effective and environmentally safe alternative to drain disposal.

Diagnostic Kits for Contaminants (Abraxis)

Polysciences has partnered with Abraxis, LLC to offer diagnostic test kits for detecting Industrial Chemical and Pesticide contaminants. The kit formats are magnetic particles (100-120 tests), microtiter plates (96 tests), coated tubes and dipstick/strips. All kit formats include ready-to-use reagents necessary to perform the test procedure. Total time for measurement is generally less than 60 minutes. The sensitivity of the assays usually allows for the direct determination of the target substances in a wide range of environmental samples such as water, soil, sediment, fish tissue, and food matrices. We can also develop custom kits to serve client's specific needs. We invite you to contact our technical specialists to discuss specifications and supply needs regarding your next project by calling (800) 523-2575/(215) 343-6484 or via info@polysciences.com

Industrial Chemicals/Hydrocarbons

	Catalog #	Size
Benzo(a)Pyrene Plate Assay Kit . . . . . Benzo(a)Pyrene is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format kit with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB530039-1	1 kit
Coplanar PCBs Assay Kit . . . . . Coplanar PCBs are detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB530011-1	1 kit
PCBs, Higher Chlorinated, Assay Kit . . . . . Higher chlorinated PCBs are detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format kit, with ready to use reagents. Enables faster assay kinetics, super sensitivity, and the simultaneous measurement of multiple samples. (100 Tests)	AB530001-1	1 kit
PCBs, Lower Chlorinated, Assay Kit . . . . . Lower chlorinated PCBs are detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB530021-1	1 kit
Polybrominated Diphenyl Ethers (PBDE), Assay Kit . . . . . PBDE is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500090-1	1 kit
Triclosan Assay Kit . . . . . Triclosan is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB530111-1	1 kit
Triclosan Assay Plate Kit . . . . . Triclosan is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format kit with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB530114-1	1 kit

Diagnostic Kits for Contaminants (Abraxis)

Pesticides

	Catalog #	Size
2,4-D Plate Assay Kit 2,4-D is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB54003B-1	1 kit
2,4-D Tube Kit Immunological laboratory test for the quantitation of 2,4-D residues in water in the range of 2.0 to 100 ng/mL (parts per billion or ppb). (96 Tests)	AB54004B-1	1 kit
Acetochlor Assay Kit Acetochlor is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500021-1	1 kit
Alachlor Assay Kit Alachlor is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500071-1	1 kit
Alachlor Plate Assay Kit Alachlor is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB500076-1	1 kit
Atrazine Assay Kit Atrazine is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. EPA/ETV Verified. (100 Tests)	AB500001-1	1 kit
Atrazine High Sensitivity (HS) Assay Kit Atrazine is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500007-1	1 kit
Atrazine Plate Assay Kit Atrazine is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB520005-1	1 kit
Atrazine Strip Test, Kit Detects two of the most common pesticides used in the US at or below the EPA Maximum Contaminant Level (atrazine-3ppb and simazine-4 ppb). Dipstick format. (20Tests)	AB500009-1	1 kit
Cyclodienes Plate Assay Kit Cyclodienes are detected using a colorimetric immunoassay (ELISA) procedure. The assay range is between 0.25 ppb and 25.0 ppb. Assay allows the determination of cyclodienes in a range of environmental samples (water, soil, sediment, fish plasma, etc.).	AB540021-1	1 kit
DDE/DDT Plate Assay Kit DDE/DDT are detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB540041-1	1 kit
Diuron Plate Assay Kit Diuron is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB520001-1	1 kit
Fluridone Assay Kit Fluridone is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500511-1	1 kit
Glyphosate Assay Kit Glyphosate is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (120 Tests)	AB500081-1	1 kit

Diagnostic Kits for Contaminants (Abraxis)

	Catalog #	Size
Glyphosate Plate Assay Kit Glyphosate is detected using a colorimetric immunoassay (ELISA)procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB500086-1	1 kit
Metolachlor Assay Kit Metolachlor is detected using a colorimetric immunoassay (ELISA)procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500061-1	1 kit
Metolachlor Plate Assay Kit Metolachlor are detected using a colorimetric immunoassay (ELISA)procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB500065-1	1 kit
Organophosphate (OP)/Carbamate Assay Kit Qualitative, colorimetric assay (modification of the Ellman method) for the detection of organophosphates and carbamates, based on a modification of their inhibition of the enzyme Acetyl Cholinesterase (Ach-E). EPA/ETV Verified.	AB550051-1	1 kit
Organophosphate (OP)/Carbamate Plate Assay Kit Using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB550055-1	1 kit
Penoxsulam Assay Kit Penoxsulam is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500501-1	1 kit
Pyrethroid Assay Kit Pyrethroid is detected using a colorimetric immunoassay (ELISA) procedure. Magnetic particle format, with ready to use reagents. (100 Tests)	AB500201-1	1 kit
Spinosyn Assay Tube Kit Spinosyn is detected using a colorimetric immunoassay (ELISA) procedure. Coated Tube format. (40 tests)	AB50020B-1	1 kit
Triazine Metabolite Plate Assay Kit Triazine Metabolite is detected using a colorimetric immunoassay (ELISA) procedure. Microtiter plate format with ready to use reagents. Enables faster assay kinetics, super sensitivity and the simultaneous measurement of multiple samples. (96 Tests)	AB520006-1	1 kit

Diagnostic Kits for Contaminants (Abraxis)

Photometer Readers

	Catalog #	Size
M6+ Manual Reader with Absorbance, Concentration & Cutoff Modes . . . . . Portable, mobile and fieldable reader, with compact and durable design. Reads directly using a choice of alternate test formats of standard microtiter plate well strips (1 x 8 or 1 x 12), or 12 mm round tubes. Easy to use, all operations are processed with only two touch buttons following prompts on the large LCD display. Computer based ELISA data reduction with 2 and 4-parameter. Weighs less than 850 grams. 450nm filter included	P475101-1	1 unit
M6+ Manual Reader with Computer Based ELISA Data Reduction . . . . . Portable, mobile and fieldable reader, with compact and durable design. Reads directly using a choice of alternate test formats of standard microtiter plate well strips (1 x 8 or 1 x 12), or 12 mm round tubes. Easy to use, all operations are processed with only two touch buttons following prompts on the large LCD display. Computer based ELISA data reduction with 2 and 4-parameter. Weighs less than 850 grams. 450nm filter included.	P475107-1	1 unit

Visit **polysciences.com/LifeSciences**
for information and new products.

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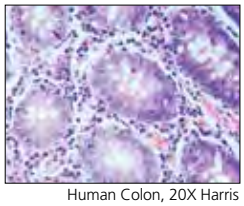
Astral Diagnostics

Cytology

	Catalog #	Size
Acrylic Mounting Medium . . . . . Histo/Cyto Mounting Medium in a toluene matrix using an acrylic resin for coverslipping.	25835-16	16 oz
	25835-4	4 oz
AQUAbluing Reagent . . . . . Bluing reagent used to provide crisp nuclear detail.	25836-1	1 gal
Bluing Reagent . . . . . Lithium Blue Lithium carbonate solution used to provide crisp nucler detail to cells.	25837-32	32 oz
	25837-1	1 gal



Human Colon, 20X Harris Hematoxylin, Eosin Y

Pap Stain
Gynecological stain used in combination with OG-6 and hematoxylin in the diagnosis of malignant cytological diseases. FDA approved for *in vitro* diagnostic use.

EA-36	25865-32	32 oz
	25865-1	1 gal
EA-50	25841-2.5	2.5 gal
EA-65	25842-2.5	2.5 gal

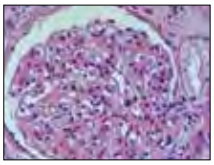
EASYpap . . . . . Gynecological single solution counterstain. A substitute to the traditional Eosin azure and Orange G. FDA approved for *in vitro* diagnostic use.	25843-32	32 oz
	25843-1	1 gal

Formalin 10%, Buffered . . . . . Most widely used fixative used for routine processing of tissue in histology laboratories.	25848-16	16 oz
	25848-1	1 gal
	25848-5	5 gal
Formalin 10%, Carson-Millonig . . . . . This fixative can be used as a dual purpose fixative, suitable for electron and light microscopy.	25849-1	1 gal
Formalin 10%, Non-Buffered . . . . . Neutralized formalin used for tisue fixation.	25850-5	5 gal
Formalin 20%, Buffered . . . . . General purpose fixative used for routine processing of tissue for light microscopy.	25851-5	5 gal

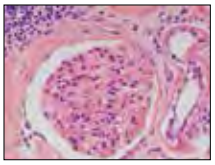
Astral Diagnostics

	Catalog #	Size
Formalin 20%, Non-Buffered Neutralized formalin used for tisue fixation.	25852-5	5 gal
	25852-30	30 gal
Formalin 5%, Buffered Fixative used for processing tissue for light microscopy.	25853-5	5 gal
Formalin Concentrate 4:1 Dilute 1 gallon of concentrate with four gallons of DI water and mix well. Product is now ready-to-use.	25961-1	1 gal
Gill EA Modified Cytoplasmic stain for clinical cytology. Used sequentially with OG-6 in the Papanicolaou staining method. FDA approved for *in vitro* diagnostic use.	25854-1	1 gal
Hematoxylin Gill 1X Gill 1X is ideal for routine cytology staining. This single strength formulation optimally stains gynecological and non-gynecological specimens. FDA approved for *in vitro* diagnostic use.	25855-16	16 oz
	25855-1	1 gal
Hematoxylin Gill 2X General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Gill 2X should be used when a stronger or darker nuclear stain is required for cytology samples or for immunohistochemical counterstaining. FDA approved for *in vitro* diagnostic use.	25856-16	16 oz
	25856-1	1 gal
Hematoxylin Gill 3X General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Gill 3X is the formulation of choice for routine histological staining when a darker nuclear stain is desired. FDA approved for *in vitro* diagnostic use.	25857-16	16 oz
	25857-1	1 gal
Hematoxylin Harris, Hg Free General purpose nuclear stain, regressive type. Used with hematoxylin and eosin staining. FDA approved for *in vitro* diagnostic use.	25858-16	16 oz
	25858-32	32 oz
	25858-1	1 gal
Hematoxylin Harris, Hg Free, Acidified General purpose nuclear stain, regressive type. Harris Hematoxylin is used for routine histology and cytology. Generally used with hematoxylin and eosin staining. FDA approved for *in vitro* diagnostic use.	25859-16	16 oz
	25859-1	1 gal

Human cheek cells, Gill's #1, Gill's Modified EA, Gill's Modified OG-6



Kidney stained with Gill's Hematoxylin #3, Eosin Y, 20X, 4



Human Kidney, 20X Harris Hematoxylin, Eosin Y

Astral Diagnostics

	Catalog #	Size
Hematoxylin General purpose nuclear stain. Useful as a counterstain for immunohistoschemistry. FDA approved for *in vitro* diagnostic use.		
Mayer's	25861-16	16 oz
	25861-1	1 gal
	25861-5	5 gal
Mayer's, Classical	25860-16	16 oz
	25860-1	1 gal
	25860-5	5 gal
Mayer's, Lillie Mod	25862-32	32 oz
Mounting Medium T . . . . . . Histo/Cyto Mounting Medium in a toluene matrix using a piccolyte resin for mounting coverslips. FDA approved for *in vitro* diagnostic use.	25864-16	16 oz
OG-6 Pap Stain . . . . . . Gill's Modified OG-6 Cytoplasmic stain for clinical cytology. Used sequentially with EA-36 or EA-50 in the Papanicolaou staining method. FDA approved for *in vitro* diagnostic use.	25866-32 25866-1 25866-2.5	32 oz 1 gal 2.5 gal
Periodic Acid Generally used in PAS staining, prior to staining with Shiff's Reagent. FDA approved for *in vitro* diagnostic use.		
1%	25873-16	16 oz
5%	25874-16	16 oz
QUICKfix . . . . . . A cytology fixative containing polyethylene glycol used to protect specimens for transport prior to processing.	25875-2 25875-4	2 oz 4 oz
Reagent Alcohol . . . . . . A blend of ethanol containing 5% isopropanol and 5% methanol. For various applications primarily in Histo/Cyto specimen processing.	25867-32 25867-1	32 oz 1 gal
Saccamanno Fluid . . . . . . Ready to use cytology fixative. Ideal for specimen such as: fine needle aspirates (FNA'S), bronchial washings, pleural and peritoneal fluids, as well as, urine and sputum.	25868-32 25868-1	32 oz 1 gal
Schiff Reagent . . . . . . Schiff Reagent is used in the Periodic Acid Staining Procedure. Intended for use with blood, bone marrow, tissue touch preparations or routine tissue sections. FDA approved for *in vitro* diagnostic use.	25876-16 25876-1	16 oz 1 gal
TRIPLEfix . . . . . . A blend of buffered alcohols used to fix fatty specimens in histological applications	25869-1 25869-5	1 gal 5 gal

Astral Diagnostics

	Catalog #	Size
Xylene Routine clearing agent. Useful for tissue processing and staining procedures.	25870-16	16 oz
	25870-1	1 gal
	25870-5	5 gal

Dermatology

Aluminum Chloride
A topical therapy used for common dermatological conditions, such as, mild to moderate hyperhidrosis.

20%	25791-4	4 oz
	25791-8	8 oz
	25791-16	16 oz
25%	25792-8	8 oz
	25792-4	4 oz
	25792-16	16 oz
30%	25793-30	16 oz
35%	25794-4	4 oz
	25794-8	8 oz
	25794-16	16 oz
35% in 70% IPA	25795-4	4 oz
	25795-8	8 oz
50%	25796-1	1 oz
	25796-4	4 oz
	25796-16	16 oz
50% in 50% IPA	25797-8	8 oz
6N	25790-4	4 oz
	25790-16	16 oz
70%	25798-4	4 oz
	25798-16	16 oz

Dichloroacetic Acid
Dichloroacetic acid is used by dermotologists primarily for chemical peels. It can be diluted according to application or desired final strength.

	25770-15	15 ml
	25770-2	2 oz

Glycolic Acid
Glycolic acid is used by dermotologists primarily for chemical peels. It can be diluted according to application or desired final strength.

30%	25771-2	2 oz
	25771-4	4 oz
35%	25772-2	2 oz
40%	25773-2	2 oz
50%	25774-2	2 oz
	25774-4	4 oz
70%	25775-2	2 oz

Astral Diagnostics

	Catalog #	Size
Jessner's Solution Jessner's Solution is used for chemical peels. Can be used in combination with Trichloroacetic acid to produce medium-depth peel. FDA approved for *in vitro* diagnostic use.	25863-4	4 oz
Salicylic Acid Salicylic Acid is used by dermotologists primarily for chemical peels. It can be diluted according to application or desired final strength.		
10%	25799-4	4 oz
20%	25800-4	4 oz
30%	25801-4	4 oz
Trichloroacetic Acid Trichloroacetic acid is used by dermotologists primarily for chemical peels. It can be diluted according to application or desired final strength.		
3%	25776-16	16 oz
5%	25777-4	4 oz
	25777-16	16 oz
10%	25778-4	4 oz
	25778-16	16 oz
15%	25779-4	4 oz
	25779-16	16 oz
20%	25780-4	4 oz
	25780-16	16 oz
25%	25781-4	4 oz
	25781-16	16 oz
30%	25782-4	4 oz
	25782-16	16 oz
35%	25783-4	4 oz
	25783-16	16 oz
40%	25784-4	4 oz
	25784-16	16 oz
50%	25785-4	4 oz
	25785-16	16 oz
70%	25786-4	4 oz
	25786-16	16 oz
80%	25787-15	15 ml
	25787-16	16 oz
	25787-4	4 oz
85%	25788-4	4 oz
	25788-16	16 oz
100%	25789-4	4 oz
	25789-16	16 oz

Astral Diagnostics

General Reagents

Acetic Acid
General reagent useful in many histological staining procedures. Available in various concentrations for your research needs.

	Catalog #	Size
Acetic Acid 1%	25934-16	16 oz
Acetic Acid 2%	25935-16	16 oz
Acetic Acid 3%	25936-16	16 oz
	25936-1	1 gal
Acetic Acid 4%	25937-16	16 oz
	25937-32	32 oz
Acetic Acid 5%	25938-16	16 oz
	25938-1	1 gal
Acetic Acid 10%	25939-16	16 oz

Acetone [67-64-1] *CH6g* . . . . . .
CH_3COCH_3
For hardening and dehydrating tissues. It can also be used for the extraction of various principles from animal and plant substances.

Merck Index 11, 58

25940-16	16 oz
25940-32	32 oz
25940-1	1 gal

Ammonium Hydroxide . . . . . .
Ammonium solution for your research needs.

25941-16	16 oz
25941-1	1 gal

Buffer, Reference
pH Buffer

Blue, pH 10.0	25980-500	500 ml
	25980-1	1 gal
	25980-5	5 gal
Clear, pH 1.0	25968-500	500 ml
Clear, pH 10.0	25977-500	500 ml
Clear, pH 2.0	25969-500	500 ml
Clear, pH 3.0	25970-500	500 ml
Clear, pH 4.0	25971-500	500 ml
Clear, pH 5.0	25972-500	500 ml
Clear, pH 6.0	25973-500	500 ml
Clear, pH 7.0	25974-500	500 ml
Clear, pH 8.0	25975-500	500 ml
Clear, pH 9.0	25976-500	500 ml
Red, pH 4.0	25978-500	500 ml
	25978-1	1 gal
	25978-5	5 gal
Yellow, pH 7.0	25979-500	500 ml
	25979-1	1 gal
	25979-5	5 gal

Astral Diagnostics

	Catalog #	Size
Copper Sulfate (S.G. 1.053) General reagent for multiple research needs. FDA approved for *in vitro* diagnostic use.	25942-16	16 oz
Deionized Water Recommended water for most research needs and clinical procedures.	25943-32	32 oz
	25943-1	1 gal
	25943-5	5 gal
	25943-30	30 gal
	25943-55	55 gal
Ethanol Solution Useful as a dehydrating reagent.		
50%	25944-1	1 gal
70%	25945-32	32 oz
	25945-8	8 oz
	25945-1	1 gal
80%	25946-1	1 gal
85%	25947-32	32 oz
95%	25948-32	32 oz
	25948-8	8 oz
	25948-1	1 gal
	25948-5	5 gal
100%	25949-32	32 oz
	25949-16	16 oz
	25949-8	8 oz
	25949-1	1 gal
	25949-5	5 gal
Ferric Subsulfate (Monsel's) Solution used to control bleeding during biopsy procedures.	25981-2D	2 oz dropper
	25981-2	2 oz
	25981-16	16 oz
Glacial Acetic Acid Ethanoic acid. Useful for many research needs.	25950-16	16 oz
	25950-1	1 gal
High Viscosity Monsel's Solution Solution used to control bleeding during biopsy procedures.	25983-1	1 oz
Hydrochloric Acid Commonly used strong acid for research needs.		
1N	25951-32	32 oz
	25952-16	16 oz
	25952-32	32 oz
6N	25953-16	16 oz
	25953-32	32 oz
10%	25954-16	16 oz
Concentrated	25955-16	16 oz

Astral Diagnostics

	Catalog #	Size
Isopropyl Alcohol Dehydrating reagent.		
70%	25956-32	32 oz
	25956-1	1 gal
99.9%	25957-16	16 oz
	25957-32	32 oz
	25957-1	1 gal
Methanol Fixative used for cytology and hematology specimen.		
Methanol	25958-16	16 oz
	25958-32	32 oz
	25958-1	1 gal
Methanol, 70%	25959-16	16 oz
	25959-32	32 oz
Potassium Hydroxide General reagent for your research needs.		
10%	25984-2	2 oz dropper
	25984-16	16 oz
	25984-1	1 gal
20%	25985-16	16 oz
Sodium Hydroxide General reagent for your research needs.		
10%	25967-4	4 oz
	25967-32	32 oz
1N	25965-32	32 oz
	25966-32	32 oz
Sulfosalicylic Acid General reagent for your research needs.		
3%	25986-16	32 oz
	25986-4	4 oz
20%	25987-16	16 oz
	25987-32	32 oz

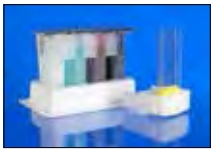
Astral Diagnostics

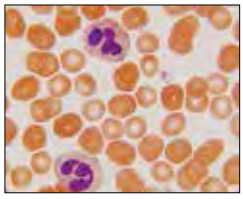
Hematology

	Catalog #	Size
B-5 Substitute Mercury-free fixative used for lymphoid and hematopoietic tissue.	25872-32	32 oz
Giemsa Stain, Azure A Giemsa stain is a classical blood film stain for peripheral blood smears and bone marrow specimens. It is used to visualize chromosomes, stain fungus histoplasma and identify mast cells. A Romanowsky stain. FDA approved for *in vitro* diagnostic use.	25803-4	4 oz
	25803-32	32 oz
Giemsa Stain, Azure A Concentrate A high concentration of Azure A in a 50/50 mixture of glycerine/methanol. Dilute to desired strength for final use. FDA approved for *in vitro* diagnostic use.	25805-1	1 gal
Giemsa Stain, Azure B A Romanowsky Stain used to stain peripheral blood and bone marrow smears.The azure B dye is the most important dye of the Romanowsky stain; it stains the nucleus varying shades of purple. FDA approved for *in vitro* diagnostic use.	25804-16	16 oz
	25804-32	32 oz
	25804-1	1 gal
Hematology Buffer Hematology buffer is used to dilute staining solutions in the Giemsa, Wright, and Wright-Giemsa staining processes. Enhances bright-orange stained erythrocytes and differentiates cells that contain nuclei.		
pH 6.4	25806-16	16 oz
	25806-32	32 oz
	25806-1	1 gal
pH 6.8	25807-16	16 oz
	25807-32	32 oz
	25807-1	1 gal
pH 7.0	25808-1	1 gal
pH 7.2	25809-32	32 oz
	25809-1	1 gal
Hematology Rinse, pH 7.0 The Hematology rinse is used for the rinsing steps required in the Giemsa, Wright, and Wright-Giemsa staining process.	25810-32	32 oz
	25810-1	1 gal
	25810-5	1 x 5 gal
Hematology Solution A, Rinse Buffered rinse solution. Used in succession after the fixation and staining of cell components. Compatible with an Aerospray Stainer. FDA approved for *in vitro* diagnostic use.	25824-16	16 oz
	25824-1	1 gal
Hematology Solution B, Thiazine Basophilic stain solution. Used in succession after fixation. Generally used in combination with the Eosin Stain (Solution C). Compatible with an Aerospray Stainer. FDA approved for *in vitro* diagnostic use.	25825-16	16 oz
	25825-1	1 gal
Hematology Solution C, Eosin Eosinophilic stain solution. Used in succession after fixation. Generally used in combination with Thiazine (Solution B). Compatible with an Aerospray Stainer. FDA approved for *in vitro* diagnostic use.	25826-16	16 oz
	25826-1	1 gal

Astral Diagnostics

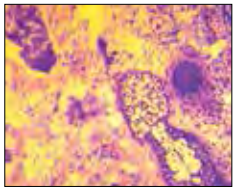
	Catalog #	Size
Hematology Solution D, Fixative	25827-16	16 oz
Hematology fixative. Compatible with an Aerospray Stainer. FDA approved for *in vitro* diagnostic use.	25827-1	1 gal
Hematology Stain Pack		
Will process up to 1500 specimen. Compatible with the Ames Hema-Tek Slide Stainer. FDA approved for *in vitro* diagnostic use.		
Wright's	25812-1	1 pack
Wright-Giemsa	25811-1	1 pack
Immersion Oil		
High Viscosity	25814-.5	.5 oz
	25814-2	2 oz
	25814-16	16 oz
Low Viscosity	25813-.5	.5 oz
	25813-2	2 oz
	25813-4	4 oz
	25813-16	16 oz
Methylene Blue	25816-60	60 ml
A staining solution used in diagnostic cytopathology and histopathology for staining immature red blood cells (reticulocyte count).	25816-4	4 oz
	25816-8	8 oz
	25816-16	16 oz
Natt-Herricks Solution	25833-16	16 oz
A traditional avian blood counting solution		
Neat Stain, Hematology, 150 Test	25815-1	1 pack
Neat Stain offers a three-step staining procedure for differentiation of morphological cell types in peripheral blood smears. Staining characteristics are similar to the traditional Wright and Wright-Giemsa stains. Performs 150 tests. FDA approved for *in vitro* diagnostic use.		
Phloxine 1% for Avian WBC	25832-4	4 oz
Solution containing phloxine B and polypropylene glycol; used to differentiate avian WBC for counting	25832-8	8 oz
	25832-32	32 oz
Quick I Blue (Wright-Giemsa)	25817-16	16 oz
Our Popular Wright-Giemsa Stain is an excellent way to demonstrate differential staining of blood and blood parasites. Wright-Giemsa is a Romanowsky stain. Giemsa serves as the primary stain, producing blue to purple nuclei. FDA approved for *in vitro* diagnostic use.	25817-32	32 oz
	25817-1	1 gal
Quick I Red (Wright)	25818-16	16 oz
Our Popular Wright's Stain uses a mixture of methylene blue dyes and eosin to differiente between blood cells; primarily peripheral blood smears and bone marrow. FDA approved for *in vitro* diagnostic use.	25818-32	32 oz
	25818-1	1 gal





Astral Diagnostics

	Catalog #	Size
Quick III Fixative Hematology fixative. FDA approved for *in vitro* diagnostic use.	25819-16 25819-1	16 oz 1 gal
Quick III Set Used for differential assessment of blood smears, detecting *H. pylori* microorganisms, sperm analysis, and interpretation of FNA biopsies. Set contains one 16oz bottle each: Fixative, Solution I (Eosin) and Solution II (Methylene blue, Azures). FDA approved for *in vitro* diagnostic use.	25820-48	3 x 16 oz
Quick III Solution I Solution I (Eosin) is used in combination with Solution II for the differential assessment of blood smears, detecting H. pylori microorganisms, sperm analysis, and interpretation of FNA biopsies. FDA approved for *in vitro* diagnostic use.	25821-16 25821-1	16 oz 1 gal
Quick III Solution II Solution II (Methylene blue, Azure) is used in combination with Solution I for the differential assessment of blood smears, detecting H. pylori microorganisms, sperm analysis, and interpretation of FNA biopsies. FDA approved for *in vitro* diagnostic use.	25822-16 25822-1	16 oz 1 gal
Quick III Stat-Pak Wide mouth jars provide convenience for dipping blood smears into the reagents. Used for differential assessment of blood smears, detecting H. pylori microorganisms, sperm analysis, and interpretation of FNA biopsies. FDA approved for *in vitro* diagnostic use. Set contains one 90 ml jar of each: Fixative, Solution I (Eosin) and Solution II (Methylene blue, Azures).	25823-270	3 x 90 ml
Wright Giemsa Stain Dual purpose stain useful for blood films, parasites and bone marrow aspirates. The ready-to-use solution makes the differentiation of human blood cells much easier to identify. Based on the commonly used Azure-Eosin formula. FDA approved for *in vitro* diagnostic use.	25829-16 25829-32 25829-1	16 oz 32 oz 1 gal
Wright Giemsa Stain Set Dual purpose stain useful for blood films, parasites and bone marrow aspirates. The ready-to-use solution makes the differentiation of human blood cells much easier to identify. Based on the commonly used Azure-Eosin formula. Set contains one 8 oz bottle of each: Wright Giemsa stain (methanol based), Buffer and Rinse. FDA approved for *in vitro* diagnostic use.	25828-1	1 set
Wright Stain Dual purpose stain used for staining blood smears and bone marrow aspirates. Ready-to-use solution makes the differentiation of human blood cells much easier to identify. FDA approved for *in vitro* diagnostic use.	25831-16 25831-32 25831-1	16 oz 32 oz 1 gal
Wright Stain Set Dual purpose stain used for staining blood smears and bone marrow aspirates. Ready-to-use solution makes the differentiation of human blood cells much easier to identify. Set contains one 8 oz bottle each: Wright stain, Buffer and Rinse. FDA approved for *in vitro* diagnostic use.	25830-1	1 set

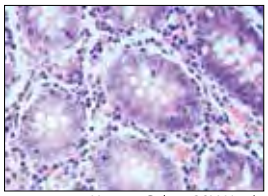


Helix shaped Helicobacter *Pylori* bacteria in human colon tissue.

Astral Diagnostics

Histology

	Catalog #	Size
Acid Alcohol Solution Differentiation solution for removing excess hematoxylin from tissue to accentuate cell structure and clarity. Differeriention in less than 60 seconds.	25834-8	8 oz
Acrylic Mounting Medium Histo/Cyto Mounting Medium in a toluene matrix using an acrylic resin for coverslipping.	25835-16	16 oz
	25835-4	4 oz
AQUAbluing Reagent Bluing reagent used to provide crisp nuclear detail.	25836-1	1 gal
B-5 Substitute Mercury-free fixative used for lymphoid and hematopoietic tissue.	25872-32	32 oz
Bluing Reagent Lithium carbonate solution used to provide crisp nucler detail to cells.	25837-32	32 oz
	25837-1	1 gal
Bouin's Fixative Picric acid, formalin and acetic acid fixative. Bouin's fixative is excellent for use in preserving soft and delicate tissue structures. FDA approved for *in vitro* diagnostic use.	25871-32	32 oz
	25871-1	1 gal
CLEARview, Histological Clarifier Differentiation solution for removing excess hematoxylin from tissue to accentuate cell structure and clarity. Differeriention in less than 60 seconds.	25838-1	1 gal
Decalcifier Mild decalcifying solution. Ideal for removing calcium from bone marrow and small bones.		
Formic Acid	25839-32	32 oz
	25839-1	1 gal
Hydrochloric Acid	25840-32	32 oz
	25840-1	1 gal



Human Colon, 20X Harris Hematoxylin, Eosin Y

Astral Diagnostics

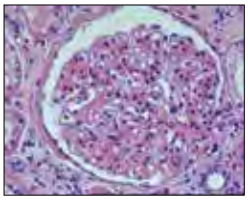
	Catalog #	Size
Eosin Y Eosin is used as a cytoplasmic counterstain in the routine Hematoxylin & Eosin (H&E) stain. FDA approved for *in vitro* diagnostic use.		
1% Alcoholic	25845-32	32 oz
	25845-1	1 gal
Intensified	25846-32	32 oz
	25846-1	1 gal
Phloxine	25844-32	32 oz
	25844-1	1 gal
Eosinophil Stain A cytoplasmic stain that is used in sequence after hematoxylin. Generally used in Hematoxylin and Eosin (H&E) stains. FDA approved for *in vitro* diagnostic use.	25802-4	4 oz
	25802-8	8 oz
	25802-16	16 oz
Formaldehyde 37% Suitable for both electron and light microscopy. Easily penetrates large blocks of tissue. When used in combination with glutaraldehyde, it fixes delicate tissues such as brain in vascular perfusion. Avoids the problem of having to depolymerize paraformaldehyde. Use in Karnovsky's fixative in conjunction with your own buffer system.	25847-32	32 oz
	25847-1	1 gal
	25847-5	5 gal
Formalin 10%, Buffered Most widely used fixative used for routine processing of tissue in histology laboratories.	25848-16	16 oz
	25848-1	1 gal
	25848-5	5 gal
Formalin 10%, Carson-Millonig This fixative can be used as a dual purpose fixative, suitable for electron and light microscopy.	25849-1	1 gal
Formalin 10%, Non-Buffered Neutralized formalin used for tisue fixation.	25850-5	5 gal
Formalin 20%, Buffered General purpose fixative used for routine processing of tissue for light microscopy.	25851-5	5 gal
Formalin 20%, Non-Buffered Neutralized formalin used for tisue fixation.	25852-5	5 gal
	25852-30	30 gal
Formalin 5%, Buffered Fixative used for processing tissue for light microscopy.	25853-5	5 gal

Human kidney tissue stained with Harris Hematoxylin and Eosin Y.

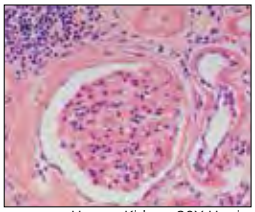
Astral Diagnostics

	Catalog #	Size
Formalin Concentrate 4:1 — Dilute 1 gallon of concentrate with four gallons of DI water and mix well. Product is now ready-to-use.	25961-1	1 gal
Hematoxylin Gill 1X — Gill 1X is ideal for routine cytology staining. This single strength formulation optimally stains gynecological and non-gynecological specimens. FDA approved for *in vitro* diagnostic use.	25855-16	16 oz
	25855-1	1 gal
Hematoxylin Gill 2X — General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Gill 2X should be used when a stronger or darker nuclear stain is required for cytology samples or for immunohistochemical counterstaining. FDA approved for *in vitro* diagnostic use.	25856-16	16 oz
	25856-1	1 gal
Hematoxylin Gill 3X — General purpose nuclear stain, progressive type. Used with hematoxylin and eosin staining. Gill 3X is the formulation of choice for routine histological staining when a darker nuclear stain is desired. FDA approved for *in vitro* diagnostic use.	25857-16	16 oz
	25857-1	1 gal
Hematoxylin Harris, Hg Free — General purpose nuclear stain, regressive type. Used with hematoxylin and eosin staining. FDA approved for *in vitro* diagnostic use.	25858-16	16 oz
	25858-32	32 oz
	25858-1	1 gal
Hematoxylin Harris, Hg Free, Acidified — General purpose nuclear stain, regressive type. Harris Hematoxylin is used for routine histology and cytology. Generally used with hematoxylin and eosin staining. FDA approved for *in vitro* diagnostic use.	25859-16	16 oz
	25859-1	1 gal

Human cheek cells, Gill's #1, Gill's Modified EA, Gill's Modified OG-6



Kidney stained with Gill's Hematoxylin #3, Eosin Y, 20X, 4



Human Kidney, 20X Harris Hematoxylin, Eosin Y

Astral Diagnostics

	Catalog #	Size
Hematoxylin General purpose nuclear stain. Useful as a counterstain for immunohistoschemistry. FDA approved for *in vitro* diagnostic use.		
Mayer's	25861-16	16 oz
	25861-1	1 gal
	25861-5	5 gal
Mayer's, Classical	25860-16	16 oz
	25860-1	1 gal
	25860-5	5 gal
Mayer's, Lillie Mod	25862-32	32 oz
Mounting Medium T . . . . . . Histo/Cyto Mounting Medium in a toluene matrix using a piccolyte resin for mounting coverslips. FDA approved for *in vitro* diagnostic use.	25864-16	16 oz
Periodic Acid Generally used in PAS staining, prior to staining with Shiff's Reagent. FDA approved for *in vitro* diagnostic use.		
1%	25873-16	16 oz
5%	25874-16	16 oz
Reagent Alcohol . . . . . . A blend of ethanol containing 5% isopropanol and 5% methanol. For various applications primarily in Histo/Cyto specimen processing.	25867-32	32 oz
	25867-1	1 gal
Schiff Reagent . . . . . . Schiff Reagent is used in the Periodic Acid Staining Procedure. Intended for use with blood, bone marrow, tissue touch preparations or routine tissue sections. FDA approved for *in vitro* diagnostic use.	25876-16	16 oz
	25876-1	1 gal
TRIPLEfix . . . . . . A blend of buffered alcohols used to fix fatty specimens in histological applications	25869-1	1 gal
	25869-5	5 gal
Xylene . . . . . . Routine clearing agent. Useful for tissue processing and staining procedures.	25870-16	16 oz
	25870-1	1 gal
	25870-5	5 gal

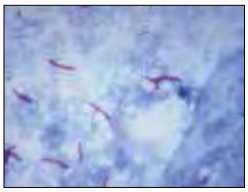
Astral Diagnostics

Microbiology

	Catalog #	Size
AFB Kinyoun, Brilliant Green Counterstain . . . . . Counterstain used in succession following carbol-fuchsin staining and decolorizing in the AFB staining procedure. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.	25877-8	8 oz
AFB Kinyoun, Decolorizer . . . . . Decolorizer used in succession following carbol-fuchsin staining in the AFB staining procedure. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.	25878-8 25878-16	8 oz 16 oz
AFB Kinyoun, Fuchsin Carbol . . . . . Carbol Fuchsin is the primary stain used in the AFB staining procedure using the Kinyoun Method. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.	25879-8	8 oz
AFB Kinyoun, Methylene Blue 1% . . . . . Counterstain used in succession following carbol-fuchsin staining and decolrizing in the AFB staining procedure. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.	25880-8	8 oz
AFB Replacement Counterstain used in succession following carbol-fuchsin staining and decolorizing in the AFB staining procedure. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.		
Kinyoun, Brilliant Green	25881-24	3 x 8 oz
Kinyoun, Decolorizer	25882-24	3 x 8 oz
Kinyoun, Fuchsin Carbol	25883-24	3 x 8 oz
Kinyoun, Methylene Blue	25884-24	3 x 8 oz
ZN, Decolorizer	25885-24	3 x 8 oz
ZN, Fuchsin Carbol	25886-24	3 x 8 oz
ZN, Methylene Blue	25887-24	3 x 8 oz
AFB Set, Kinyoun, Brilliant Green Counterstain . . . . . AFB Kit (Kinyoun Method). Used to detect acid-fast microorganisms, specifically mycobacterium. Set contains 8oz bottle of each: Carbol fuchsin, Decolorizer, and Brilliant Green Counterstain. FDA approved for *in vitro* diagnostic use.	25888-1	1 set

Astral Diagnostics

	Catalog #	Size
AFB Set, Kinyoun, Methylene Blue Counterstain Used to detect acid-fast microorganisms, specifically mycobacterium. Set contains 8oz bottle of each: Carbol fuchsin, Decolorizer, and Methylene Blue Counterstain. FDA approved for *in vitro* diagnostic use.	25889-1	1 set
AFB Set, Ziehl-Neelson Used to detect acid-fast microorganisms, specifically mycobacterium. Set contains 8oz bottle of each: Carbol fuchsin, Decolorizer, and Methylene Blue Counterstain. FDA approved for *in vitro* diagnostic use.	25890-1	1 set
AFB, Ziehl-Neelson, Fuchsin Carbol Carbol Fuchsin is the primary stain used in the AFB staining procedure using the Ziehl Neelson Method. Used to detect acid-fast microorganisms, specifically mycobacterium. FDA approved for *in vitro* diagnostic use.	25891-8	8 oz
Alcian Blue Used primarily for demonstrating acid mucopolysaccarides. Used in electrophoresis for detecting glycoproteins. pH 2.5	25892-4 25892-16 25892-32	4 oz 16 oz 32 oz
Chlorazol Black E Provides successful staining for Mycoplasm and L-Forms of Staphlococcus aureus	25893-2	2 oz
Crystal Violet Crystal Violet staining stains nuclei a deep purple color, aiding in their visualization. It can also be used to visualize colonies of cells. FDA approved for *in vitro* diagnostic use.	25895-8 25895-1	8 oz 1 gal
Crystal Violet Replacement	25894-32	4 x 8 oz
Decolorizer Can be used with the Gram stain, Kinyoun stain (acidic aqueous), and Ziehl-Neelsen stain. FDA approved for *in vitro* diagnostic use.	25899-8 25899-1	8 oz 1 gal
Decolorizer Replacement	25898-32	4 x 8 oz
Decolorizer 1:1 Can be used with the Gram stain, Kinyoun stain (acidic aqueous), and Ziehl-Neelsen stain. FDA approved for *in vitro* diagnostic use.	25896-1	1 gal
Decolorizer Replacement 1:1 Can be used with the Gram stain, Kinyoun stain (acidic aqueous), and Ziehl-Neelsen stain. FDA approved for *in vitro* diagnostic use.	25897-32	4 x 8 oz



Mycobacterium tuberculosis bacteria revealed using acid-fast Ziehl- Neelson stain; Magnified 1000X. Image courtesy of CDC Publich Health Library/Dr. George P. Kubica.

Astral Diagnostics

	Catalog #	Size
Gentian Violet Gentian Violet Solution is used in the Gram Stain. It is intended for the demonstration and differentiation of Gram-positive and Gram-negative bacteria. Gentian Violet is the component that results in blue staining of the Gram Positive Bacteria. FDA approved for *in vitro* diagnostic use.		
1%	25900-16	16 oz
2%	25901-2	2 oz
	25901-16	16 oz
Gomori Trichrome Stain Gomori's One Step Trichrome refers to the multiple stain reaction of this reagent only. FDA approved for *in vitro* diagnostic use.	25902-8	8 oz
	25902-16	16 oz
Lacto Phenol Cotton Blue Standard microbiological stain for identifying parasites in wet mount preparation of stool specimen. FDA approved for *in vitro* diagnostic use.	25933-4	4 oz
	25933-16	16 oz
Malachite Green A dye used as a biological stain to demonstrate bacterial spores. It is also useful in other research areas as needed.	25921-8	8 oz
	25921-16	16 oz
Methylene Blue 1% Biological stain. Achieves intense blue staining of the nuclei.	25922-4	4 oz
	25922-16	16 oz
Methylene Blue, Loeffler Multipurpose stain for staining leukocytes and bacteria. FDA approved for *in vitro* diagnostic use.	25923-4	4 oz
Microguard Crystal Violet Stain used for the differiential staining of bacteria. FDA approved for *in vitro* diagnostic use.	25924-16	16 oz
MicroGuard Gram Crystal Violet Crystal Violet is used in the Gram's Staining method for the difference of Gram Positive and Gram Negative bacteria. FDA approved for *in vitro* diagnostic use.	25904-32	32 oz
MicroGuard Gram Crystal Violet Replacement Crystal Violet is used in the Gram's Staining method for the difference of Gram Positive and Gram Negative bacteria. FDA approved for *in vitro* diagnostic use.	25903-64	4 x 16 oz
MicroGuard Gram Decolorizer 75/25 Gram's Decolorizer is used in Gram Staining protocols. The Gram stain is used to classify bacteria on the basis of their form, size, cellular morphology, and Gram reaction. FDA approved for *in vitro* diagnostic use.	25906-16	16 oz
MicroGuard Gram Decolorizer Replacement Gram's Decolorizer is used in Gram Staining protocols. The Gram stain is used to classify bacteria on the basis of their form, size, cellular morphology, and Gram reaction. FDA approved for *in vitro* diagnostic use.	25907-64	4 x 16 oz

Astral Diagnostics

	Catalog #	Size
MicroGuard Gram Decolorizer Replacement 1:1 Gram's Decolorizer is used in Gram Staining protocols. The Gram stain is used to classify bacteria on the basis of their form, size, cellular morphology, and Gram reaction. FDA approved for *in vitro* diagnostic use.	25905-64	4 x 16 oz
MicroGuard Gram Iodine Replacement, Stabilized Pre-mixed, ready-to-use iodine. Used in the Gram Staining protocol. FDA approved for *in vitro* diagnostic use.	25908-64	4 x 16 oz
MicroGuard Gram Iodine Replacement, Traditional Prepare fresh. Used in the Gram Staining protocol. Consists of ingredients to prepare fresh iodine. FDA approved for *in vitro* diagnostic use.	25909-64	4 x 16 oz
MicroGuard Gram Iodine, Stabilized Pre-mixed, ready-to-use iodine. Used in the Gram Staining protocol. FDA approved for *in vitro* diagnostic use.	25910-1	1 gal
MicroGuard Gram Safranin Replacement Used in the Gram Staining protocol. FDA approved for *in vitro* diagnostic use.	25911-64	4 x 16 oz
MicroGuard Gram Stain Set The Gram Stain is used for the differiential staining of bacteria. Set consists of "pre-mixed" iodine. FDA approved for *in vitro* diagnostic use.		
Stabilized Iodine	25912-8	4 x 2 oz
	25913-32	4 x 8 oz
	25913-64	4 x 16 oz
Traditional	25914-32	4 x 8 oz
	25914-64	4 x 16 oz
MicroGuard Iodine Replacement, Stabilized Pre-mixed, ready-to-use iodine. FDA approved for *in vitro* diagnostic use.	25915-32	4 x 8 oz
MicroGuard Iodine Replacement, Traditional Prepare fresh. Consists of ingredients to prepare fresh iodine. FDA approved for *in vitro* diagnostic use.	25916-32	4 x 8 oz
MicroGuard Iodine, Lugol's Lugol's Iodine is used in the Gram Staining protocol. FDA approved for *in vitro* diagnostic use.	25919-1	1 gal
MicroGuard Iodine, Lugol's Concentrate Strong iodine solution for your research needs. Used in the Gram stain protocol. FDA approved for *in vitro* diagnostic use.	25917-2	2 oz
	25917-4	4 oz
	25917-16	16 oz
MicroGuard Iodine, Lugol's Working Solution Ready-to-use iodine solution. No further dilution is necessary. Used in the Gram stain protocol. FDA approved for *in vitro* diagnostic use.	25918-2	2 oz
	25918-16	16 oz

Astral Diagnostics

	Catalog #	Size
MicroGuard Iodine, Stabilized Pre-mixed, ready-to-use iodine. Used in the Gram Staining protocol. FDA approved for *in vitro* diagnostic use.	25920-8 25920-16	8 oz 16 oz
Microguard Safranin Stain used for the differiential staining of bacteria. FDA approved for *in vitro* diagnostic use.	25925-16	16 oz
Neat Stain, Gram Stain Rapid 3-step differential Gram Stain, designed specifically for "stat" procedures. Set consists of self-contained foil sealed, pre-filled multi-well containers. Performs 150 test. FDA approved for *in vitro* diagnostic use.	25926-1	1 set
Neat Stain, Slide Holder Plastic slide holder used with Neat stains. Holds up to 5 slides for convenient easy staining purposes as needed.	25988-1	1 unit
Neat Stain, Trichrome Rapid 3-step differential Trichrome Stain, designed specifically for "stat" procedures of stool specimen. Set consists of self-contained foil sealed, pre-filled multi-well containers. Performs 75 test. FDA approved for *in vitro* diagnostic use.	25927-1	1 set
Nuclear Fast Red Nuclear fast red staining is a simple method of nuclear chromatin staining and is mainly used for high-contrast counterstaining for histological applications.	25928-4 25928-16	4 oz 16 oz
Safranin Safranin is a counterstain used to stain nuclei red. Safranin is a traditional counterstain to the popular Gram stain. FDA approved for *in vitro* diagnostic use.	25930-8 25930-1	8 oz 1 gal
Safranin Replacement Safranin is a counterstain used to stain nuclei red. Safranin is a traditional counterstain to the popular Gram stain. FDA approved for *in vitro* diagnostic use.	25929-32	4 x 8 oz
Sternheimer-Malbin Stain The Sternheimer-Malbin Stain is a commonly used supravital stain containing crystal-violet and safranin. Leukocytes, epithelial cells, and casts stain well with this stain.	25931-1 25931-15 25931-2 25931-4	1 oz 15 ml 2 oz 4 oz
Toluidine Blue 1% Toluidine Blue Stain consisting of a a basic thiazine metachromatic dye used to aid in the identification of microbiological diseases, such as H. pylori. Toluidine Blue 1% is also useful in staining plastic sections or electron microscopy thick sections.	25932-4 25932-16	4 oz 16 oz

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Polysciences stocks a wide portfolio of monomers. Such variety offers the synthetic chemist the tools to make a rich array of polymer compositions. Our Monomers Selection Guide organizes this set of reactive monomers into various groupings. These organized sets of data will enable the scientist to quickly determine which specific monomer can be used to synthesize custom polymers that meet their needs. In reviewing the data in these selection guides, you will be able to compare and contrast monomer alternatives quickly. More detailed information and chemical structures are included in the alphabetical listing which follows.

Polysciences also stocks a wide portfolio of polymers. This variety provides the formulation scientist a useful set of tools to design compositions with markedly different performance. These polymers can also be used by the synthetic scientist as platforms on which to build yet more complex polymer systems.

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Acid Containing Monomers

Acidic groups are often used to convey solubility to polymers in aqueous media. These moieties can be converted to a wide range of alternative functional groups. Acid groups can be utilized as catalysts for chemical reactions. Additionally they are employed in polymers as a functional group which enables improved adhesion to a variety of substrates through hydrogen bonding or metal chelation.

	Polymerizable Sites	Polymerizable Synthon	Form of Acid	Special Features	Catalog #	Size	Page
Acrylic acid min. 99.0%	mono	acrylic	carboxylic acid	makes water soluble polymers	00020-250	250 g	210
Acrylic anhydride min. 90%	mono	acrylic	carboxylic acid (protected)	not a crosslinker	00488-50	50 g	210
tert-Butyl methacrylate	mono	acrylic	carboxylic acid (protected)	acid formed by thermal elimination of isobutylene, homopolymer, Tg = 107° C	02058-100	100 g	217
3-Butene-1,2,3-tricarboxylic acid	mono				01396-25	25 g	215
β-Carboxyethyl Acrylate, >98% Active	mono	acrylic	carboxylic acid	high purity, hydrophilic	24891-100	100 g	217
Methacrylic Acid, 99.9%	mono	acrylic	carboxylic acid	high purity, hydrophilic	24897-250	250 g	233
Methacrylic acid, min. 99.5%	mono	acrylic	carboxylic acid	offers latex stability, homo-polymer Tg = 185° C	00212-450	450 g	234
4-Methacryloxyethyl trimellitic anhydride	mono	acrylic	anhydride	hydrolyzed acid offers improved adhesion	17285-10	10 g	235
Methacryloyl-L-Lysine	mono	acrylic	amino acid	zwitterionic, can derivatize through acid or amine	24315-5	5 g	235
o-Nitrobenzyl methacrylate, min. 95%	mono	acrylic	carboxylic acid (protected)	acid formed by photolabile deprotection	24360-10	10 g	238
2-Propene-1-sulfonic acid, sodium salt, 35% soln. in water	mono	vinyl	sulfonic acid salt	water soluble	00064-10	10 g	243
2-Sulfoethyl methacrylate, >90%	mono	acrylic	sulfonic acid ester	water soluble	02597-50	50 g	245
Trichloroacrylic acid	mono	acrylic	carboxylic acid	carboxylic acid	02686-10	10 g	246
4-Vinylbenzoic acid	mono	styrenic	carboxylic acid	versatile -COOH synthesis handle, aromatic acid	04485-5	5 g	250

Acid Containing Monomers, Metal Salts

	Polymerizable Sites	Polymerizable Synthon	Form of Acid	Special Features			
Barium methacrylate, >95%	dual	acrylic	metal salt	metal salt	01994-50	50 g	212
Lithium methacrylate	mono	acrylic	metal salt	water soluble	17117-50	50 g	233
Magnesium acrylate	dual	acrylic	metal salt	ionic crosslinking, high Tg polymers	02467-10	10 g	233
Sodium acrylate	mono	acrylic	metal salt	can make high Tg salt polymers	01207-50	50 g	244
3-Sulfopropyl acrylate, potassium salt	mono	acrylic	sulfonic acid salt	water soluble	17209-100	100 g	245
3-Sulfopropyl methacrylate, potassium salt, 98%	mono	acrylic	sulfonic acid salt	water soluble	17210-100	100 g	245
Zinc (di)methacrylate	dual	acrylic	metal salt	ionomeric crosslinker	03011-100	100 g	252

Acrylic Monomers (Neutral, Monofunctional)

Monofunctional acrylics shape the type and nature of the main chain polymer backbone. Monomers are chosen to obtain the desired glass transition temperature, flexibility, mechanical strength, polarity and hydrophilic/hydrophobic character of the resulting polymer. Generally, acrylamides exhibit improved resistance to hydrolysis compared to acrylic/methacrylic esters.

	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
N-Acryloylmorpholine	147	hydrophilic	21192-50	50 g	211
Benzhydryl methacrylate		high RI (ca 1.56), aromatic	24286-10	10 g	212
Benzyl acrylate, ~99%	6	high RI (ca 1.55), aromatic	01997-100	100 g	213
Benzyl methacrylate, min. 95%	54	high RI (ca 1.57), aromatic	02000-100	100 g	213
N-Benzylmethacrylamide		high RI (ca 1.60), aromatic	17969-25	25 g	213
2-n-Butoxyethyl methacrylate, ~99%		moderate polarity	02034-100	100 g	215
n-Butyl acrylate, min. 99%	-54	hydrocarbon building block monomer	02037-500	500 g	215
iso-Butyl methacrylate	53	hydrocarbon building block monomer	02056-500	500 g	216
n-Butyl methacrylate	20	hydrocarbon building block monomer	02059-3	3 kg	216
sec-Butyl acrylate	12	hydrocarbon building block monomer	02038-25	25 g	216
sec-Butyl methacrylate	60	hydrocarbon building block monomer	02057-10	10 g	216
tert-Butyl acrylate	43	hydrocarbon building block monomer	02039-250	250 g	217
tert-Butyl methacrylate	107	hydrophobic / protected acid	02058-100	100 g	217
4-Chlorophenyl acrylate	58	high RI (ca 1.55), chlorinated aromatic	01331-10	10 g	218
Cyclohexyl acrylate, min 85%	19	aliphatic, hydrophobic	02109-100	100 g	219
Cyclohexyl methacrylate, ~98%	83	aliphatic, hydrophobic	01837-100	100 g	219
iso-Decyl acrylate	-55	hydrophobic, low Tg	03008-100	100 g	219
n-Decyl methacrylate, 99%	-30	hydrophobic	23344-25	25 g	220
iso-Decyl methacrylate, min. 90%		hydrophobic	22493-100	100 g	220
N,N-Diethylacrylamide, min. 95%		polar building block	00871-25	25 g	221
N,N-Dimethylacrylamide, min. 98%	89	useful for chromatographic resins	02255-100	100 g	222
N,N-Dimethylmethacrylamide		hydrolytic stability, useful for hydrogels	02270-25	25 g	223
n-Dodecyl acrylate	-3	hydrophobic, long chain alkyl	02460-50	50 g	225
New! N-Dodecylacrylamide		hydrophobic, long chain alkyl	25723-5	5 g	225
N-Dodecylmethacrylamide	15	hydrophobic, hydrolytic stability	04135-10	10 g	225
n-Dodecyl methacrylate	-55	hydrophobic. Low Tg , long chain alkyl	02461-250	250 g	225
2-Ethylhexyl acrylate	-50	hydrophobic	00587-250	250 g	226
N-Ethylmethacrylamide		hydrolytic stability, useful for hydrogels	02322-10	10 g	226
2-(2-Ethoxyethoxy)ethyl acrylate	-70		02626-100	100 g	226
1-Hexadecyl methacrylate	22	hydrophobic, aliphatic	02396-25	25 g	228
n-Hexyl acrylate, min. 98%	-45	hydrophobic, aliphatic	02411-100	100 g	230
New! N-(Isobutoxymethyl)acrylamide			25998-50	50 ml	232
Methacryloxyethyl trimethylammonium			16639-100	100 g	235
2-Methoxyethyl acrylate	-50	low Tg monomer	02487-100	100 g	236
2-Methoxyethyl methacrylate, min.85%	16	moderate polarity	02488-100	100 g	236
Methyl methacrylate, min 99.5%	105	versatile building block monomer	00834-1	1 liter	236
2-Naphthyl acrylate	24	Hydrophobic, fluorescent, aromatic	06024-1	1 g	238
Neopentyl methacrylate		hydrophobic	06127-10	10 g	238
N-(n-Octadecyl)acrylamide		hydrophobic	04673-10	10 g	239
n-Octyl methacrylate, 99+%	-20	hydrophobic	23355-25	25 g	239
N-tert-Octylacrylamide		hydrophobic, hydrolytic stability	03141-25	25 g	239
Pentabromophenyl acrylate		high RI (ca 1.7), brominated, flame retardent	06344-10	10 g	239
Pentabromophenyl methacrylate		high RI (ca 1.7), brominated, flame retardent	04253-5	5 g	240
Pentafluorophenyl acrylate		perfluorophenyl, low surface energy	06349-5	5 g	240
Pentafluorophenyl methacrylate, 95%		perfluorophenyl, low surface energy	06350-5	5 g	240
2-Phenoxyethyl methacrylate	54	aromatic, hydrophobic	02640-100	100 g	241
Phenyl acrylate, min. 95%	57	UV absorbing, aromatic	02642-10	10 g	241

	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
Phenyl methacrylate , >95%	110	moderate UV absorbing, aromatic, hydrophobic	02644-10	10 g	241
2-Phenylethyl acrylate, min. 92%	-3	moderate UV absorbing, aromatic, hydrophobic	02834-100	100 g	241
2-Phenylethyl methacrylate, min. 92%	26	moderate UV absorbing, aromatic, hydrophobic	02911-100	100 g	241
n-Propyl acrylate	-37	building block monomer	03132-25	25 g	244
n-Propyl methacrylate	35	building block monomer	03174-100	100 g	244
N-iso-Propylacrylamide	85	hydrophilic	02455-25	25 g	244
Stearyl acrylate	35	hydrophobic, can form crystal domains	02636-100	100 g	245
Stearyl methacrylate	38		02637-100	100 g	245
Tetrahydrofurfuryl acrylate	-12		02907-250	250 g	246
Tribromoneopentyl methacrylate		bromo non-aromatic	03057-10	10 g	246
2,4,6-Tribromophenyl acrylate		high RI (ca 1.6), brominated aromatic	03330-10	10 g	246
Triethylene glycol monomethyl ether monomethacrylate		hydrophilic	18556-500	500 g	247
3,3,5-Trimethylcyclohexyl methacrylate		aliphatic, bulky	02660-25	25 g	248
Undecyl methacrylate		hydrophobic	02544-25	25 g	249

Adhesion Promoting Monomers

Functional groups known to increase adhesion of polymers to surfaces include phosphate and carboxylic acids (metal adhesion) and silyl ethers (glass/siliceous adhesion) which hydrolyze to give reactive Si-OH bonds. While these monomers are well studied examples, many monomers having functional groups such as acids, amines and hydroxyls can also impart polymer adhesion to various substrates. Please refer to other tables for a more expansive listing of these monomers. Also see Amine Monomer section.

	Polymerizable Sites	Polymerizable Synthon	Add'l. Reactive Functionality	Special Features			
Acrylic acid min. 99.0%	mono	acrylic	carboxylic acid	acid provides metal adhesion	00020-250	250 g	210
Bis(2-methacryloxyethyl) phosphate	dual	acrylic	phosphate	crosslinking monomer with adhesion promoting capabilties, good for metals	16041-10	10 g	213
2-(Methacryloxy)ethyl phosphate	mono	acrylic	phosphate	used for introducing phosphorus into polymers, adhesion promoter	25422-50	50 ml	234
4-Methacryloxyethyl trimellitic anhydride	mono	acrylic	anhydride	adhesion promoter through anhydride	17285-10	10 g	235
3-Methacryloxypropyltrimethoxysilane	mono	acrylic	silyl ether	ethers react with glass surfaces to improve adhesion, glass pretreatment for polyacrylamide gels	02476-250	250 g	235
Monoacryloxyethyl phosphate	mono	acrylic	phosphate	used for introducing phosphorus into polymers, adhesion promoter	22468-10	10 g	237
Vinyltriethoxysilane	mono	vinyl	silyl ether	reactive silyl ethers hydrolyze affording bonding sites to siliceous surfaces	04537-50	50 g	251

Amine Containing Monomers

Amines are among the most widely versatile functional groups. In biopolymers, amines are the key synthetic handle to build structure and architecture to a polymer. Amine groups can act as base catalysts, can be quaternized to yield aqueous soluble polymers and can function as ligands to a variety of metals. Amines are good nucleophiles and can be converted to a wide set of functional groups. Amines can form salts with carboxylic and phosphoric acids to form biologically interesting complexes and structures.

	Polymerizable Sites	Polymerizable Synthon	Add'l. Reactive Functionality	Special Features	Catalog #	Size	Page
2-Acryloxyethyltrimethylammonium chloride	mono	acrylic	quaternary, HCl salt		17981-250	250 g	210
1-(Acryloyloxy)-3-(Methacryloyloxy)-2-Propanol	dual	acrylic			25351-50	50 ml	211
2-Aminoethyl methacrylate hydrochloride, min. 95%	mono	acrylic	primary, HCl salt		21002-10	10 g	211
N-(2-aminoethyl) methacrylamide hydrochloride	mono	acrylic	secondary, HCl salt		24833-5	5 g	211
N-(t-BOC-aminopropyl) methacrylamide	mono	acrylic	primary (protected)	solvent soluble for primary amine polymers	24318-10	10 g	212
N-(3-Aminopropyl)methacrylamide hydrochloride, >98%	mono	acrylic	primary, HCl salt		21200-5	5 g	212
2-(tert-Butylamino)ethyl methacrylate, min. 90%	mono	acrylic	secondary	homopolymer Tg = 33° C	01797-100	100 g	216
Diallylamine, min. 98%	dual	vinyl	secondary	form cyclopolymers	21424-100	100 g	221
Diallyldimethylammonium chloride, 65% soln. in water	dual	vinyl	quat	cationic polymers via cyclopolymerization	15912-100	100 g	221
4,4'-Diamino-3,3'-dinitrodiphenyl ether		amine		preparation of polyamides, polyimides	16685-10	10 g	221
3,3'-Diaminodiphenyl sulfone, min 98%		amine		preparation of polyamides, polyimides	21393-50	50 g	221
2-(N,N-Diethylamino)ethyl methacrylate	mono	acrylic	tertiary	homopolymer Tg = 20° C	01872-500	500 g	222
2-(Diethylamino)ethylstyrene, mixed m,p-isomers, min. 95%	mono	vinyl	tertiary		24100-5	5 g	222
2-Diisopropylaminoethyl methacrylate	mono	acrylic	tertiary		24263-10	10 g	222
2-(N,N-Dimethylamino)ethyl acrylate	mono	acrylic	tertiary		02257-500	500 g	223
2-(N,N-Dimethylamino)ethyl methacrylate, min. 99%	mono	acrylic	tertiary	homopolymer Tg = 19° C	00213-500	500 g	223
N-[2-(N,N-Dimethylamino) ethyl]methacrylamide	mono	acrylic	tertiary	hydrolytic stability	06172-5	5 g	223
N-[3-(N,N-Dimethylamino) propyl]acrylamide, min.95%	mono	acrylic	tertiary	homopolymer Tg = 19° C	22018-10	10 g	223
N-[3-(N,N-Dimethylamino) propyl]methacrylamide	mono	acrylic	tertiary	hydrolytic stability	09656-100	100 g	223
3-Dimethylaminoneopentyl acrylate	mono	acrylic	tertiary		17970-10	10 g	223
New! N-Dodecylacrylamide	mono	acrylic	secondary		25723-5	5 g	225
N-Dodecylmethacrylamide	mono	acrylic	secondary		04135-10	10 g	225
2-Methacryloxyethyltrimethylammonium chloride					16639-100	100 g	235
Methacryloyl-L-Lysine	mono	acrylic	amino acid	zwitterionic, can derivatize through acid or amine, water soluble	24315-5	5 g	235

	Polymerizable Sites	Polymerizable Synthon	Add'l. Reactive Functionality	Special Features	Catalog #	Size	Page
Methacryloylcholine methyl sulfate, 40% soln. in water					05810-100	100 g	236
2-N-Morpholinoethyl acrylate, 95%	mono	acrylic	tertiary		17977-100	100 g	237
2-N-Morpholinoethyl methacrylate, 95%	mono	acrylic	tertiary		17978-100	100 g	237

Crosslinking Acrylic Monomers – Difunctional

Difunctional monomers are useful for imparting crosslinking or branching sites to polymer architectures. The "spacer" group between the acrylic end groups often helps determine the physical and mechanical attributes of the resulting crosslinked polymer structure. Acrylic moieties are generally more reactive than methacrylic moieties and are thus used when faster reaction kinetics are desired (e.g. UV curable systems.)

	Add'l. Reactive Functionality	Special Features			
1-(Acryloyloxy)-3-(Methacryloyloxy)-2-Propanol	hydroxyl		25351-50	50 ml	211
Barium methacrylate, >95%	carboxylic acid	divalent metal atom salt	01994-50	50 g	212
2,2-Bis[4-(2-acryloxyethoxy)phenyl]propane	rigid hydrophibic, crosslinker	rigid, aromatic	04136-25	25 g	213
Bis(2-methacryloxyethyl) N,N'-1,9-nonylene biscarbamate		flexible, hydrophobic	21619-50	50 g	213
Bis(2-methacryloxyethyl) phosphate	phosphate	crosslinking monomer with adhesion promoting capabilities, good for metals	16041-10	10 g	213
2,2-Bis(4-methacryloxyphenyl)propane		rigid, hydrophobic	01381-25	25 g	213
Bisphenol A-bis(2-hydroxypropyl) acrylate		UV curable	25431-50	50 ml	214
1,4-Butanediol diacrylate, min. 85%		aliphatic	02049-100	100 g	214
1,3-Butanediol dimethacrylate, 98%		aliphatic	02047-500	500 g	215
1,4-Butanediol dimethacrylate, min. 90%		aliphatic	05973-250	250 g	215
Copper (II) methacrylate	carboxylic acid	divalent metal atom salt	21222-25	25 g	218
trans-1,4-Cyclohexanediol dimethacrylate		rigid, aliphatic	18912-10	10 g	219
N,N'-Cystaminebisacrylamide, Electro Pure™	disulfide	reversible crosslinking	09809-5	5 g	219
1,10-Decanediol dimethacrylate		flexible, aliphatic, long chain	02140-25	25 g	219
1,4-Diacryloylpiperazine		rigid	21190-10	10 g	220
N,N-Diallylacrylamide	acrylic		01848-10	10 g	221
Diethylene glycol diacrylate		hydrophilic	02215-100	100 g	222
Diethylene glycol dimethacrylate		hydrophilic	02214-100	100 g	222
2,2-Dimethylpropanediol dimethacrylate		aliphatic	02276-100	100 g	223
N, N' Ethylene Bisacrylamide		hydrogel crossslinker	09811-1	1 g	225
Ethylene glycol diacrylate		UV curable, acrylate	02302-25	25 g	225
Ethylene glycol dimethacrylate, 99.7%		hydrophilic, high purity	24896-250	250 g	226
Ethylene glycol dimethacrylate, min 88%		hydrophilic	02303-250	250 g	226
Ethylene glycol dimethacrylate, min 98%		hydrophilic	24030-250	250 g	226
Fluorescein dimethacrylate		fluorescent	23589-100	100 mg	226
1,3-Glyceryl dimethacrylate		hydrophilic	25420-50	50 ml	227
N,N'-Hexamethylenebisacrylamide		hydrolytic stability	01495-5	5 g	230
1,6-Hexanediol diacrylate		aliphatic	23671-100	100 g	230
1,6-Hexanediol dimethacrylate, min 98%		aliphatic	23672-100	100 g	230
2,2-Bis[4-(2-hydroxy-3-methacryloxypropoxy) phenyl]propane		rigid, aromatic	03344-100	100 g	230
Lead acrylate			02968-100	100 g	233
Magnesium acrylate	carboxylic acid	divalent metal atom salt	02467-10	10 g	233
N,N'-Methylenebisacrylamide, Chemzymes®; Ultra Pure, Purity >99%		hydrogel crosslinker	00719-100	100 g	236
1,9-Nonanediol dimethacrylate		flexible, aliphatic	00801-10	10 g	238

	Add'l. Reactive Functionality	Special Features	Catalog #	Size	Page
1,5-Pentanediol dimethacrylate		aliphatic	04260-25	25 g	240
1,4-Phenylene diacrylate		rigid, aromatic	06389-10	10 g	241
Tetraethylene glycol dimethacrylate		aliphatic	02654-50	50 g	246
Tricyclodecane dimethanol diacrylate			25110-50	50 g	247
Triethylene glycol diacrylate		UV curable, acrylate > methacrylate	02655-250	250 g	247
Triethylene glycol dimethacrylate			01319-250	250 g	247
		aliphatic	24034-100	100 g	247
Zinc (di)methacrylate	carboxylic acid	ionomeric crosslinker	03011-100	100 g	252

Crosslinking Acrylic Monomers – Multifunctional

Typically used for generating highly crosslinked polymer structures, these monomers increase polymer toughness, modulus and solvent resistance. For UV curable formulations, multifuntional acrylates are typically faster reacting than their methacrylate analogs.

	Polymerizable Sites	Add'l. Reactive Functionality	Special Features			
Dipentaerythritol pentaacrylate (mixture of tetra-, penta-, hexaacrylate)	multiple		high crosslinking efficiency	16311-500	500 g	224
Pentaerythritol tetraacrylate	multiple			01547-100	100 g	240
Pentaerythritol triacrylate	tri	hydroxyl	multifunctional crosslinker	04259-100	100 g	240
PEO(5800)-b-PPO(3000)-b-PEO(5800) dimethacrylate	di			25430-1	1 g	243
[PEO(10700)-b-PPO(4500)] 4-ethylenediamine tetramethacrylate	tetra			25429-1	1 g	243
1,1,1-Trimethylolpropane triacrylate	tri		useful for UV cure	02658-250	250 g	249
1,1,1-Trimethylolpropane trimethacrylate	tri		useful for UV cure	02659-250	250 g	249

Dual Reactive Acrylic Monomers

It is often desirable to synthesize polymer architectures that are capable of further reaction to incorporate new functionality, graft new polymer chains, attach drugs or biomolecules, or make the polymer respond intelligently to changes in its environment. This diverse set of monomers have easily polymerizable carbon-carbon double bonds yet contain a secondary reactive group that can be elaborated in a multitude of ways. Some reactive groups e.g., carboxylic acid in o-nitrobenzyl methacrylate (Cat. #24360) are masked and are revealed by simple deprotection schemes.

	Add'l. Reactive Functionality	Special Features			
Acrylic anhydride min. 90%	anhydride (protected)	allows formulation of cyclic anhydrides	00488-50	50 g	210
4-(2-Acryloxyethoxy)-2-hydroxybenzophenone	phenol	benzophenone is a strong UV absorber, potential UV radical initiator	19931-10	10 g	210
N-Acryloxysuccinimide	ester (protected)	derivitization through ester link using mild reaction conditions, good for biologically active compounds	19930-1	1 g	210
Allyl methacrylate	olefin	allyl double bond is less reactive than methacrylate, good for post polymerization reactions	01643-500	500 g	211
2-Aminoethyl methacrylate hydrochloride, min. 95%	amine (as HCl salt)	can be used to prepare polymers with amine functionality	21002-10	10 g	211
N-(t-BOC-aminopropyl)methacrylamide	amine (protected)	t-BOC easily deprotected tp yield primary amine	24318-10	10 g	212
N-(3-Aminopropyl)methacrylamide hydrochloride, >98%	amine (as HCl salt)	can be used to prepare polymers with amine functionality	21200-5	5 g	212
2-Bromoethyl acrylate, min. 95%	halogen	allows synthesis of heavy atom polymers, Br can be displaced with various nucleophiles	02015-10	10 g	214
2-(tert-Butylamino)ethyl methacrylate, min. 90%	amine (secondary)	builds polymers with secondary amines, potential H-bonding site	01797-100	100 g	216

	Add'l. Reactive Functionality	Special Features	Catalog #	Size	Page
tert-Butyl acrylate	carboxylic acid (protected)	used in photoresist formulations	02039-250	250 g	217
2-Cinnamoyloxyethyl acrylate	α,β unsat. ester	photocrosslinking monomer	24014-10	10 g	218
Cinnamyl methacrylate	functionalized styrene	photocrosslinking monomer	02092-5	5 g	218
2-Cyanoethyl acrylate	nitrile	polar building block monomer, can use nitrile for functionalization	01829-100	100 g	219
N,N-Diallylacrylamide	allyl	crosslinking monomer	01848-10	10 g	221
Dicyclopentenyloxyethyl acrylate	ethenyl	endo cyclic olefin does not readily polymerize, can be post reacted e.g. oxidative crosslinking	15797-25	25 g	221
Glycerol monomethacrylate, mixture of isomers	hydroxyl	isomer mixture, useful in hydrogel preparation, -OH can be functionalized in multiple ways	04180-25	25 g	227
Glycidyl methacrylate	epoxide	versatile, introduces reactive sites into polymers, can be derivatized in post polymerization reactions with various nucleophiles	02607-500	500 g	227
2-Hydroxyethyl acrylate	hydroxyl	hydrophilic monomer building block	01902-250	250 g	231
Hydroxypropyl methacrylate, mixture of isomers	hydroxyl	hydrophilic monomer building block, can be post reacted through hydroxyl	00730-500	500 g	232
N-(2-Hydroxypropyl)methacrylamide	hydroxyl	hydrophilic monomer building block, can be post reacted through hydroxyl group	08242-10	10 g	232
3-Methacryloxypropyltrimethoxysilane	silyl ether	ethers react with silaceous surfaces to improve adhesion, glass pretreatment for polyacrylamide gels	02476-250	250 g	235
Methacryloyl chloride, min. 80%	halogen	reactive building block monomer. Also used to prepare other specialty monomers	01518-50	50 g	235
Methacryloyl fluoride	halogen	reactive building block monomer. Also used to prepare other specialty monomers	17414-25	25 g	235
Methyl 2-cyanoacrylate	cyano	used in rapidly setting cements and adhesives	01520-10	10 g	236
N-Methylolacrylamide, 48% soln. in water		acid catalyzed post polymerization, crosslinking capabilties	02518-250	250 g	237
Monoacryloxyethyl phosphate	phosphate	used for introducing phosphorus into polymers, adhesion promoter	22468-10	10 g	237
o-Nitrobenzyl methacrylate, min. 95%	carboxylic acid (protected)	nitrobenzyle ester removed by UV irradiation to afford carboxylic acid, used for catalysis, photoresists and latent reactive acid	24360-10	10 g	238
N-(Phthalimidomethyl)acrylamide	active methylene	used in photoresist formulations	19390-25	25 g	241
Propargyl acrylate	acetylenic	acetylenic group can be post functionalized, possible oxidative crosslinking monomer	02964-25	25 g	243
Propargyl methacrylate	acetylenic	acetylenic group can be post functionalized, possible oxidative crosslinking monomer	02965-25	25 g	243
Tricyclodecane dimethanol diacrylate			25110-50	50 g	247

Epoxides / Anhydrides / Imides

Unlike ethylenic monomers which polymerize through free radical processes, epoxide resins react with amines, carboxylic acids, anhydrides, etc. to form polymers displaying a range of characteristics from tough and durable to soft and adhesive.

	Polymerizable Sites	Special Features			
Allyl glycidyl ether	mono	can react either epoxide or allyl group into polymers	19191-50	50 g	211
4,4'-Bisphenol A Bis-(N-Methylphthalimide)	dual	useful monomer for synthesis of high temp. polymers	24284-25	25 g	214
4,4'-Bisphenol A Dianhydride	dual	useful monomer for synthesis of high temp. polymers	24283-25	25 g	214

	Polymerizable Sites	Special Features	Catalog #	Size	Page
1,4-Butanediol diglycidyl ether	dual	can be used for post polymerization corsslinking of amine polymers	01795-50	50 g	215
Ethylene glycol diglycidyl ether (Quetol 651)	dual	active crosslinking monomer for active nucelophiles, hydrophilic, used for hydrogels	01479-100	100 g	225
Glycidyl butyl ether	mono	used in epoxy reactions as monofunctional diluent	05678-500	500 g	227
Glycidyl cinnamate	mono	polymerized with various carboxylic acids, alcohols and amines, Olefin moiety can be photocrosslinked	16090-10	10 g	227
Glycidyl Glycerol-Ether, Polyfunctional	multiple	isomer mixture, efficient crosslinking monomer for various nucleophilic agents	09221-50	50 g	227
Glycidyl nonylphenyl ether	mono	epoxy functional	18236-100	100 g	227
Methacrylic anhydride		uncrosslinked	01517-100	100 ml	234
Propylene glycol diglycidyl ether	dual	versatile crosslinker for amine, hydroxyl and carboxylate systems	24044-100	100 g	244
Propylene Oxide, EM Grade	mono	basic building block monomer for water dispersible polymers	00236-1	1 pint	244
Triglycidyl isocyanurate	tri	crosslinking monomer for epoxy, urethane systems	16173-50	50 g	248

Fluorescent Acrylic Monomers

Monomers with fluorescent tags are often used to build polymers that can be detected at very low concentrations using fluorescence spectroscopy. Polymer migration and diffusion has been studied using fluorescent tags. Polymer microspheres containing fluorescent groups are used routinely for flow cytometry and medical diagnostic assays.

	Monomer Type	Special Features			
Acryloxyethyl thiocarbamoyl Rhodamine B		Ex. max = 548 nm, Em. max = 570 nm	25404-100	100 mg	216
9-Anthracenylmethyl methacrylate	neutral	Ex. max = 362 nm, Em. max = 407 nm, yellow crystals	23587-100	100 mg	212
3,8-Dimethacryloyl ethidium bromide	ionic	Ex. max = 439 nm, Em. max = 512 nm, Insoluble in water	23590-100	100 mg	222
Fluorescein dimethacrylate	neutral	Ex. max = 470 nm, Em. = 511 nm	23589-100	100 mg	226
Methacryloxyethyl thiocarbamoyl rhodamine B	ionic, mixture isomers	Ex. max = 548 nm, Em. max = 570 nm, purple crystals	23591-100	100 mg	234
2-Naphthyl acrylate	neutral	Hydrophobic, fluorescent monomer	06024-1	1 g	238
2-Naphthyl methacrylate	neutral	Ex. max = 285 nm, Em. min = 345 nm	23602-100	100 mg	238
Nile Blue Acrylamide		Em. max = 674 nm in H2O, dark blue crystals	25395-100	100 mg	238
1-Pyrenylmethyl methacrylate	neutral	Ex. max = 339 nm, Em. max = 394 nm, pale yellow crystals	23588-100	100 mg	244

Fluorinated Acrylic Monomers

Monomers containing fluorine provide polymers with unique low energy surfaces. Materials made from these monomers are typically chemical resistant and very hydrophobic.

	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
1H,1H,7H-Dodecafluoroheptyl methacrylate	13	low RI (ca 1.36), aliphatic	00767-25	25 g	224
1H,1H,2H,2H-Heptadecafluorodecyl acrylate	0	low RI (ca 1.34)	19227-25	25 g	228
1H,1H,2H,2H-Heptadecafluorodecyl methacrylate	40	low RI (ca 1.35)	19226-25	25 g	228
1H,1H-Heptafluorobutyl acrylate	-30	low RI (ca 1.37)	21039-25	25 g	228
1H,1H,3H-Hexafluorobutyl acrylate	-22	low RI (ca 1.39)	05631-10	10 g	229
1H,1H,3H-Hexafluorobutyl methacrylate		low RI (ca 1.40)	05632-10	10 g	229
Bis-(1,1,1,3,3,3-Hexafluoroisopropyl) Itaconate			24971-25	25 g	229
1,1,1,3,3,3-Hexafluoroisopropyl Acrylate			24970-25	25 g	229
Hexafluoro-iso-propyl methacrylate		low RI (ca 1.38)	02401-10	10 g	229
1H,1H,5H-Octafluoropentyl acrylate	-35	low RI (ca 1.38)	21044-25	25 g	239
1H,1H,5H-Octafluoropentyl methacrylate, min. 98%	36	low RI (ca 1.39)	21045-25	25 g	239
Pentafluorophenyl acrylate		perfluorophenyl, low surface energy	06349-5	5 g	240
Pentafluorophenyl methacrylate, 95%		perfluorophenyl, low surface energy	06350-5	5 g	240
1H,1H,3H-Tetrafluoropropyl methacrylate		low RI (ca 1.4), aliphatic	07577-25	25 g	246
2,2,2-Trifluoroethyl acrylate	-10	low RI (ca 1.44), aliphatic	01718-25	25 g	247
2,2,2-Trifluoroethyl methacrylate	80	low RI (ca 1.41), aliphatic	02622-25	25 g	247
Bis-(2,2,2-Trifluoroethyl) Itaconate			24972-25	25 g	248

High / Low Refractive Index Monomers

Polymers that interact with light can be modified by optimizing their refractive index properties. These materials are useful in many types of optical applications: lenses, optical switches, optical fiber coatings, etc. Low RI monomers are typically highly fluorinated. Polymers using perfluorinated monomers are often hydrophobic and exhibit very low surface energies.

	Polymerizable Sites	Homopolymer Tg (°C)	Special Features			
Allyl Phenyl Ether, 98%	vinyl		high RI (ca 1.52), hydrophobic	24894-100	100 g	211
Benzyl acrylate, ~99%	acrylic	6	high RI (ca 1.55), non-halogenated	01997-100	100 g	213
Benzyl methacrylate, min. 95%	acrylic	54	high RI (ca 1.57), non-halogenated	02000-100	100 g	213
N-Benzylmethacrylamide	acrylic		high RI (ca 1.60), non-halogenated	17969-25	25 g	213
2-(9H-Carbazole-9-yl) ethyl methacrylate	acrylic		high RI (ca 1.69)	24372-1	1 g	217
4-Chlorophenyl acrylate	acrylic	58	high RI (ca 1.55), chlorinated aromatic	01331-10	10 g	218
3-Chlorostyrene, 98%		90	high RI (ca 1.57)	02042-5	5 g	218
1H,1H,7H-Dodecafluoroheptyl methacrylate	acrylic	13	low RI (ca 1.36), fluorinated aliphatic	00767-25	25 g	224
1H,1H,2H,2H-Heptadecafluorodecyl acrylate	acrylic	0	low RI (ca 1.34), fluorinated	19227-25	25 g	228
1H,1H,2H,2H-Heptadecafluorodecyl methacrylate	acrylic	40	low RI (ca 1.35), fluorinated	19226-25	25 g	228
1H,1H-Heptafluorobutyl acrylate	acrylic	-30	low RI (ca 1.37), fluorinated	21039-25	25 g	228
1H,1H,3H-Hexafluorobutyl acrylate	acrylic	-22	low RI (ca 1.39), fluorinated	05631-10	10 g	229
1H,1H,3H-Hexafluorobutyl methacrylate	acrylic		low RI (ca 1.40), fluorinated	05632-10	10 g	229
Hexafluoro-iso-propyl methacrylate	acrylic		low RI (ca 1.38), fluorinated	02401-10	10 g	229
1H,1H,5H-Octafluoropentyl acrylate	acrylic	-35	low RI (ca 1.38), fluorinated	21044-25	25 g	239

	Polymerizable Sites	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
1H,1H,5H-Octafluoropentyl methacrylate, min. 98%	acrylic	36	low RI (ca 1.39), fluorinated	21045-25	25 g	239
Pentabromophenyl acrylate	acrylic		high RI (ca 1.7), brominated, flame retardant, aromatic	06344-10	10 g	239
Pentabromophenyl methacrylate			high RI (ca 1.7), brominated, flame retardant, aromatic	04253-5	5 g	240
1H,1H,3H-Tetrafluoropropyl methacrylate	acrylic		low RI (ca 1.4), fluorinated aliphatic	07577-25	25 g	246
2,4,6-Tribromophenyl acrylate	acrylic		high RI (ca 1.6), brominated aromatic	03330-10	10 g	246
2,2,2-Trifluoroethyl acrylate	acrylic	-10	low RI (ca 1.44), fluorinated aliphatic	01718-25	25 g	247
2,2,2-Trifluoroethyl methacrylate	acrylic	80	low RI (ca 1.41), fluorinated aliphatic	02622-25	25 g	247
N-Vinylcarbazole	vinyl		high RI (ca 1.68)	02429-25	25 g	250

Hydroxy Containing Monomers

Hydroxyl groups have utility as hydrogen bonding sites and can provide polymers with compatibility for water or polar solvents. These versatile functional groups can be derivitized broadly. Polymers containing free –OH groups can be post reacted with acids, epoxies, isocyanates, etc. to create novel polymer properties and architectures.

	Polymerizable Sites	Polymerizable Synthon	Add'l. Reactive Functionality	Special Features			
4-(2-Acryloxyethoxy)-2-hydroxybenzophenone	mono	acrylic	phenol	UV absorbing, aromatic	19931-10	10 g	210
4-tert-Butoxystyrene, min. 99%	mono	styrene	phenol (protected)	deprotect with heat	21760-10	10 g	215
Glycerol monomethacrylate, mixture of isomers	mono	acrylic	hydroxyl	isomer mixture, useful in hydrogel prepara-tion	04180-25	25 g	227
(HEMA 10) Poly Ethoxy (10) ethyl methacrylate	mono	acrylic	hydroxyl	hydrophilic	24890-100	100 g	228
2-hydroxy-3-chloropropyl methacrylate	mono	acrylic	hydroxyl		25421-50	50 ml	230
2-Hydroxyethyl acrylate	mono	acrylic	hydroxyl	hydrophilic monomer building block, homo-polymer Tg = 15° C	01902-250	250 g	231
Hydroxypolyethoxy (10) Allyl Ether, 98%	mono	vinyl	hydroxyl	hydrophilic	24899-100	100 g	232
Hydroxypropyl methacrylate, mixture of isomers	mono	acrylic	hydroxyl	aliphatic	00730-1	1 kg	232
N-(2-Hydroxypropyl) methacrylamide	mono	acrylic	hydroxyl	hydrolytic stability	08242-10	10 g	232
2-methacryloxyethyl phenyl urethane (MAPU)	mono	acrylic			25507-100	100 g	234
3-Phenoxy 2 hydroxy propyl methacrylate (PHPM)	mono	acrylic	hydroxyl		25506-100	100 g	240
Sodium 1-Allyloxy-2 hydroxypropyl Sulfonate				sulfonate salt	24898-100	100 g	245
1,1,1-Trimethylolpropane diallyl ether	mono	vinyl	hydroxyl	hydrophilic crosslinker	05500-50	50 g	248
1,1,1-Trimethylolpropane monoallyl ether	mono	vinyl	hydroxyl	hydrophilic crosslinker	15914-50	50 g	248

Mono and Difunctional Glycol Oligomeric Monomers

Ethylene glycol units are strongly hydrophilic through their multiple H-bonding sites. Monomers of this type are useful in the construction of hydrogels and water compatible polymer structures. New research suggests that bioactive molecules e.g. drugs with attached PEG chains have improved bioavailablity characteristics.

	Polymerizable Synthon (Sites)	Add'l. Reactive Functionality	Approx. # of Glycol Groups	Approx. MW	Special Features	Catalog #	Size	Page
Poly(ethylene glycol) (n) diacrylate	acrylic (2)	none	4 to 6	314	hydrophilic cross-linking monomer	00669-250	250 g	242,289
	acrylic (2)	none	8 to 10	500	hydrophilic cross-linking monomer	01871-250	250 g	242,289
	acrylic (2)	none		1,000		25485-1	1 g	242
	acrylic (2)	none	90 to 100	4,100	hydrophilic cross-linking monomer	15246-1	1 g	242,289
Poly(ethylene glycol) (n) dimethacrylate	methacrylic (2)	none	4 to 6	350	hydrophilic cross-linking monomer	00096-100	100 g	242,289
	methacrylic (2)	none	8 to 10	550		15179-100	100 g	242,289
	methacrylic (2)	none	13 to 15	750		02364-100	100 g	242,289
	methacrylic (2)	none	21 to 25	1,150		15178-100	100 g	242,289
		none	~ 182	8,000		25428-2	2 g	242,289
		none	~ 450	20,000		25406-5	5 g	242,289
Poly(ethylene glycol) (n) monomethacrylate	methacrylic (1)	hydroxy	4 to 6	270	long chain monomer, more polar than PO analog, can post react -OH to add additonal functionality	16712-100	100 g	242,290
	methacrylic (1)	hydroxy	8 to 10	480		16713-100	100 g	242,290
	methacrylate (1)	hydroxy	~ 45	2,000		25427-1	1 g	242
Poly(ethylene glycol) (n) monomethyl ether monomethacrylate	methacrylic (1)	none	4 to 6	280	adds hydrophilic grafts to polymers; adds long chain hydrophilic graft to polymer chain	16664-100	100 g	242
	methacrylic (1)	none	8 to 10	490		16665-100	100 g	242
	methacrylic (1)	none	21 to 25	1,090		16666-100	100 g	242
	methacrylic (1)	none	~ 43	1,900		25425-1	1 g	243
	methacrylic (1)	none	~ 114	5,000		25426-1	1 g	243
Poly(propylene glycol) dimethacrylate	methacrylic (2)	none	5 to 7	550	less polar than EO analog, insoluble crosslinker	04380-250	250 g	243

Styrenic Monomers

Popular alternatives to acrylic and related monomers, styrenic monomers generally provide polymers of higher glass transition temperature, higher modulus, increased hydrophobic character and nominal UV absorbance. As such, coatings made with high concentrations of styrenic monomers can yellow with time if exposed to UV light. Crosslinked styrene resins (especially in microsphere form) are tough and chemically resistant. These form the basis for ion exchange resins and microbeads used as supports for biochemical reactions.

	Monomer Type	Add'l. Reactive Functionality	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
4-tert-Butoxystyrene, min. 99%	protected group	phenol		deprotection gives phenol	21760-10	10 g	215
4-(tert-Butyl)styrene, 95%	neutral		132	high Tg monomer	02606-25	25 g	216
4-Chloromethylstyrene	reactive	halogen		Merrifield resin building block	22193-25	25 g	217
Chloromethylstyrene, 43% para, 57% meta, ~96%	reactive	halogen		Merrified resin building block	02718-500	500 g	218
3-Chlorostyrene, 98%			90	high RI (ca 1.57)	02042-5	5 g	218
2-(Diethylamino)ethylstyrene, mixed m,p-isomers, min. 95%				amine functional styrene monomer	24100-5	5 g	222
Divinylbenzene					01892-100	100 g	224
	neutral	vinyl		aromatic, rigid crosslinker	22478-100	100 g	224
2-Methylstyrene	neutral		120	aromatic, hydrophobic	04581-5	5 g	237
4-Methylstyrene	neutral		108	aromatic, hydrophobic	04234-100	100 g	237
4-Nitrostyrene	reactive	nitro		nitro can be reduced to amine	02634-5	5 g	238
Styrene	neutral		100		00660-500	500 g	245
4-Vinylbenzoic acid	reactive	carboxylic acid		amine aromatic, versatile -COOH synthesis handle	04485-5	5 g	250

Sulfonate Containing Monomers

	Polymerizable Sites	Polymerizable Synthon	Form of Acid	Special Features			
2-Sulfoethyl methacrylate, >90%	mono	acrylic	sulfonic acid	water soluble	02597-50	50 g	245
3-Sulfopropyl methacrylate, potassium salt, 98%	mono	acrylic	sulfonic acid salt	water soluble	17210-100	100 g	245
3-Sulfopropyldimethyl-3-methacrylamidopropylammonium, inner salt				zwitterionic detergent and crosslinker	16570-5	5 g	245

UV (light) Active Monomers

Polymers with aliphatic backbones often show little absorbance of light and usually do not absorb in the near and mid UV spectral range. UV absorbing monomers improve the capture of light at these wavelengths. These absorbers can be used to shield the polymer system or an underlying substrate from degradation by UV light, e.g. phenethyl methacrylate containing polymers for optical lenses. Additionally, some UV absorbing materials can act as sensitizers to promote photochemical reactions.

	Polymerizable Synthon	Add'l. Reactive Functionality	Homopolymer Tg (°C)	Special Features			
2(5-Benzotriazolyl 3-t-butyl 4-methacryloxy)phenyl propionic acid, isooctyl ester	acrylic	α,β unsat.		UV absorber	24241-1	1 g	212
2-Cinnamoyloxyethyl acrylate	acrylic	α,β unsat.		photocrosslinking monomer	24014-10	10 g	218
Cinnamyl methacrylate	acrylic	α,β unsat.		photocrosslinking monomer	02092-5	5 g	218

	Polymerizable Synthon	Add'l. Reactive Functionality	Homopolymer Tg (°C)	Special Features	Catalog #	Size	Page
Glycidyl cinnamate	epoxide	ethenyl		polymerized with various carboxylic acids, alcohols and amines, Olefin moiety can be photocrosslinked	16090-10	10 g	227
2-(2'-Hydroxy-5'-methylphenyl)-benzotriazole				UV absorber	21363-25	25 g	230,292
2-(2'-Methacryloxy-5'-methylphenyl)benzotriazole	acrylic			UV absorber	21871-25	25 g	235
Phenyl acrylate, min. 95%	acrylic		57	UV absorbing, aromatic	02642-10	10 g	241
Phenyl methacrylate, >95%	acrylic		110	moderate UV absorbing, aromatic, hydrophobic	02644-10	10 g	241
2-Phenylethyl acrylate, min. 92%	acrylic		-3	moderate UV absorbing, aromatic, hydrophobic	02834-100	100 g	241
2-Phenylethyl methacrylate, min. 92%	acrylic		26	moderate UV absorbing, aromatic, hydrophobic	02911-100	100 g	241
N-(Phthalimidomethyl) acrylamide	acrylic			used in photoresist formulations	19390-25	25 g	241

Vinyl and Ethenyl Monomers

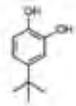
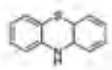
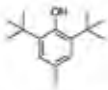
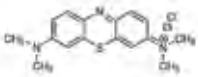
An alternative choice to styrenics and acrylics, these monomers are often used to create polymers with inert main chain features. Many of these monomers can be polymerized via metallocene or other metal mediated polymerization processes.

	Polymerizable Sites	Add'l. Reactive Functionality	Special Features			
Acrolein, distilled, 99% EM grade	mono	aldehyde		00016-5	5 x 10 ml	210
Allyl glycidyl ether	mono	epoxide	can react either epoxide or allyl groups into polymers	19191-50	50 g	211
2,2-Bis[4-(2-acryloxyethoxy) phenyl]propane	dual	rigid crosslinker	rigid, aromatic	04136-25	25 g	213
3-Butene-1,2,3-tricarboxylic acid	mono			01396-25	25 g	215
Diallyl Maleate	dual vinyl	vinyl	hydrophilic	02156-250	250 g	220
Diallyl Maleate–99% Active	dual vinyl	vinyl	hydrophilic	24892-100	100 g	220
Diallyl phthalate, practical	dual			02159-1	1 kg	220
Diallylamine, min. 98%	dual	amine (secondary)	forms cyclopolymers	21424-100	100 g	221
Diallyldimethylammonium chloride, 65% soln. in water	dual		cationic polymers via cyclopolymerization	15912-100	100 g	221
3-Isopropenyl-α,α-dimethylbenzyl Isocyanate	mono	isocyanate		19706-100	100 g	222
Divinyl Adipate	dual			25338-100	100 g	224
Divinyl glycol	dual			18252-25	25 g	224
Divinyl sebacate	dual			04632-5	5 g	224
N-methyl N-vinyl acetamide	mono		hydrophilic	22065-25	25 g	236
2-Propene-1-sulfonic acid, sodium salt, 35% soln. in water	mono		water soluble, sulfonic acid, Na salt	00064-10	10 g	243
Triallyl cyanurate	tri			01236-100	100 g	246
Triethylene glycol divinyl ether	dual			19560-100	100 g	247
1,1,1-Trimethylolpropane diallyl ether	multi	hydroxyl	hydrophilic crosslinker	05500-50	50 g	248

	Polymerizable Sites	Add'l. Reactive Functionality	Special Features	Catalog #	Size	Page
1,1,1-Trimethylolpropane mono-allyl ether	mono	hydroxyl	hydrophilic crosslinker	15914-50	50 g	248
N-vinyl acetamide (NVA)	mono			24806-50	50 g	249
Vinyl azlactone	mono			21329-5	5 g	249
Vinyl benzoate	mono			02664-50	50 g	250
Vinyl butyrate	mono			02835-10	10 g	250
N-Vinylcaprolactam, min. 98%	mono			16818-10	10 g	250
N-Vinylcarbazole	mono		high RI (ca 1.68)	02429-25	25 g	250
Vinylferrocene	mono		iron complex	04503-1	1 g	250
Vinyl 2-furoate	mono			02829-10	10 g	250
1-Vinylimidazole	mono			01726-100	100 g	251
Vinyl octadecyl ether	mono		hydrophobic	01728-100	100 g	251
4-Vinylpyridine	mono			02668-100	100 g	251
N-Vinyl-2-pyrrolidone	mono		hydrophilic	04000-250	250 g	251
Vinyl stearate, min. 95%	mono			01784-100	100 g	251
Vinyltriethoxysilane	mono	silyl ether	reactive silyl ethers hydrolyze affording bonding sites to silaceous surfaces, adhesion promoter	04537-50	50 g	251
Vinyltriphenylsilane				21543-10	10 g	252

Polymerization Inhibitors for Monomers

Throughout the Monomer section, we list monomers which are inhibited with a variety of polymerization inhibitors. These inhibitors are chosen for effectiveness, and minimum color formation on storage. Below is a table identifying the inhibitors used and their structures.

Inhibitor	Chemical Name	Structure	Inhibitor	Chemical Name	Structure
HQ	Hydroquinone		Triethylene diamine (DABCO®)	2,4-Diazabicyclo[2.2.2] octane	
MEHQ	Hydroquinone monomethyl ether		t-Butylcatechol	4-t-butylcatechol	
PTZ	Phenothiazine		BHT(butylated hydroxytoluene)	2,6-di-t-Butyl-4-methyl-phenol	
Methylene Blue	3,7-Bis(dimethylamino) -phenazathionium chloride		p-t-Butylphenol	4-t-Butylphenol	

NOTES

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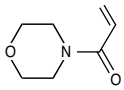
	Catalog #	Size
A		
Acrolein, distilled, 99% EM grade [107-02-8] *BCOPR6acg* MW 56.1 bp 52–53° n_D^{20} 1.4025 1000 ppm HQ TSCA $H_2C{=}CHCHO$ Used in combination with other aldehydes such as formaldehyde or glutaraldehyde to fix very dense specimens since acrolein penetrates and reacts faster than other fixatives. Distilled and packaged in serum vials for easy handling. Requires Poison Pack *J. Histochem. Cytochem., 30, 1307 (1982)*	00016-5	5 x 10 ml
Acrylamide, Chemzymes Ultra Pure® [79-06-1] *HMO6d* MW 71.08 mp 84–85° Tg 165° uninhibited TSCA $H_2C{=}CHCONH_2$ Specific conductance of 35% (w/v) solution 2µmho/cm. Used in electrophoresis for separation of nucleic acid fragments and proteins. For introduction of hydrophilic sites, preparation of water-soluble polymers and in electrophoresis. Technical Data Sheet #155	00019-100 00019-500	100 g 500 g
Acrylic acid min. 99.0% [79-10-7] *BEH7g* MW 72.1 mp 13° bp 139° Tg 106° n_D^{20} 1.420 200 ppm MEHQ TSCA $H_2C{=}CHCO_2H$ Copolymerizes with many other monomers to introduce acid groups which are important in crosslinking, adhesion promotion, and stabilization of emulsion polymers. Homopolymers are water soluble.	00020-250	250 g
Acrylic anhydride min. 90% [2051-76-5] *BH7d* MW 126.1 bp 97°/35mm n_D^{20} 1.444 500 ppm MEHQ $(H_2C{=}CHCO)_2O$ Used to prepare specialty acrylate, acrylamide monomers. Forms cyclic anhydrides on polymerization and does not produce crosslinks in polymers.	00488-50	50 g
4-(2-Acryloxyethoxy)-2-hydroxybenzophenone [67845-93-6] *A2g* MW 312.3 mp 77–80° uninhibited TSCA For introduction of UV-absorbing sites into polymers.	19931-10	10 g
Acryloxyethyl thiocarbamoyl Rhodamine B MW 668.24 purple solid Fluorescent monomer useful for labeling polymers. **Ex. max**: 548nm **Em. max**: 570nm	25404-100	100 mg
2-Acryloxyethyltrimethylammonium chloride [44992-01-0] *H5g* MW 193.6 500 ppm MEHQ TSCA $H_2C{=}CHCO_2CH_2CH_2N(CH_3)_3Cl$ For preparation of water-soluble cationic polymers, introduction of cationic sites. 80% solution in water.	17981-250	250 g
N-Acryloxysuccinimide [38862-24-7] *U4d* MW 169.1 mp 69° C For preparation of acrylic derivatives, e.g., of biologically active compounds or dyes either in monomer or polymer form under mild conditions.	19930-1 19930-5	1 g 5 g

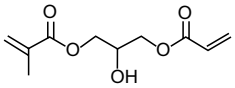
	Catalog #	Size
N-Acryloylmorpholine [5117-12-4] *U7ag*	21192-50	50 g

MW 141.2 bp 104°/4mm Tg 147° n_D^{20} 1.512 1000 ppm MEHQ
For preparation of water-soluble (neutral substituted acrylamide) polymers.



1-(Acryloyloxy)-3-(Methacryloyloxy)-2-Propanol [1709-71-3]	25351-50	50 ml
	25351-100	100 ml

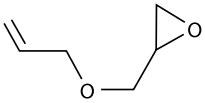
MW 214.22 n_D^{20} 1.473 d 1.14 g/mL at 25° C 200 ppm MEHQ
Colorless to pale yellow viscous liquid $C_{10}H_{14}O_5$
Will increase the hydrophilic properties of polymers when copolymerized into a range of acrylate and methacrylate systems. This monomer has been used in antibacterial, liquid crystalline and phosphorous containing resins. The methacrylate and acrylate functionality provide increased reactivity relative to the dimethacrylate crosslinker.



Duygu Avci and Lon J. Mathias, Polymer Bulletin, 2005, 54 (1-2), 11-19 Senhaji, O.; Monge, S.; Chougrani, K.; Robin, J. Macromolecular Chemistry and Physics, 2008, 209(16), 1694–1704. Dizman, B.; Elasri, M.O.; Mathias, L.J. Biomacromolecules, 2005, 6 (1), 514–520.

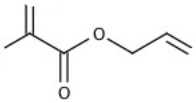
Allyl glycidyl ether [106-92-3] *EHO5g*	19191-50	50 g

MW 114.1 bp 154° n_D^{20} 1.433 TSCA
Reactive allyl ether. Can be used to introduce epoxide functionality into polymers made by free-radical polymerization.



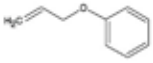
Allyl methacrylate [96-05-9] *CH5g*	01643-500	500 g

MW 126.2 bp 55°/30mm n_D^{20} 1.436 100 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CH{=}CH_2$
Contains polymerizable units of differing reactivity, methacrylate moiety being more reactive than allyl. Requires Poison Pack



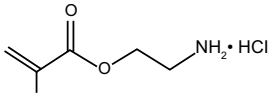
Allyl Phenyl Ether, 98% [1746-13-0] *H4d*	24894-100	100 g

MW 134 bp 185 n_D^{20} 1.52 Specific gravity (20° C): 0.97 Amber Liquid TSCA
High purity monomer which has a high refractive index allowing it to be used as a synthon in modifying polymer refractive index properties.



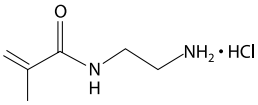
2-Aminoethyl methacrylate hydrochloride, min. 95% [2420-94-2] *B6e*	21002-10	10 g

MW 166.6 mp 121 – 124° uninhibited TSCA
$H_2C{=}C(CH_3)CO_2CH_2CH_2NH_2$
For preparation of polymers containing primary amine groups and preparation of specialty methacrylate monomers.
Technical Data Sheet #522



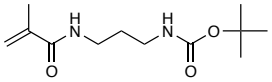
N-(2-aminoethyl) methacrylamide hydrochloride *U7d*	24833-5	5 g

mp 121 – 123° C (polymerization is initiated around 122° C)
White to off-white free flowing powder $(C_6H_{12}N_2O)HCL$
Monomer building block for polymerization reactions which may yield a primary amine functional polymer.



	Catalog #	Size
N-(t-BOC-aminopropyl)methacrylamide [2197-397-94] *U2bd*	24318-10	10 g

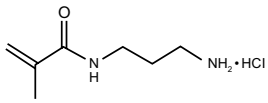
MW 242 mp 81–83° C uninhibited solid white powder
$C_{12}H_{22}O_3N_2$



A solvent soluble, blocked primary amine monomer, it is soluble in a range of organic solvents and it polymerizes readily with other vinylic monomers. The t-BOC group is widely known to those in the peptide field and is easily deprotected to the free amine with a variety of reagents including HCl/MeOH, Me^3Sil, or heat (185° C). Copolymers containing N-(N-BOC-aminopropyl)methacrylamide can be readily converted to primary amino copolymers which can be further modified by coupling to peptides, dyes, etc.

N-(3-Aminopropyl)methacrylamide hydrochloride, >98% [72607-53-5] *U2bd*	21200-5	5 g

MW 178.7 mp 122–124° uninhibited TSCA
$(C_7H_{14}N_2O)HCL$

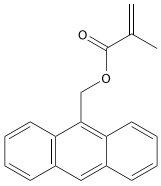


Primary amine monomer. Hydrolytically stable for preparation of polymers containing primary amine functionality.
Technical Data Sheet #522

For use of N-(3-Aminopropyl)methacrylamide hydrochloride to make reductively biodegradable hydrogels for tissue engineering, see: Vetrik, M. et al, Polymer Degradation and Stability 96 (2011) 892-897

9-Anthracenylmethyl methacrylate [31645-35-9] *U3ag*	23587-100	100 mg
	23587-1	1 g

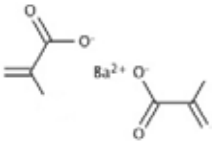
PolyFluor® 407 MW 276.2 mp 82 – 84° Yellow crystals
Fluorescent monomer.



B

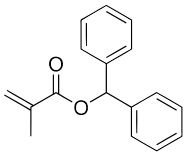
Barium methacrylate, >95% [17989-77-4] *HJX7d*	01994-50	50 g

MW 307.5 TSCA
$[H_2C{=}C(CH_3)CO_2]_2Ba$
Polymerizable metal salt.



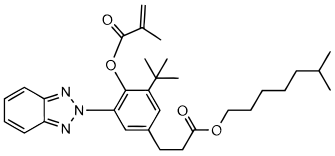
Benzhydryl methacrylate [25574-72-5] *U5d*	24286-10	10 g

MW 252.3 mp 80–82° C n^{20}_D (polymer) ~1.56
$(C_6H_5)_2CHOCO\ C(CH_3){=}CH_2$
Monomer with high refractive index. Useful in ophthalmic applications. Technical Data Sheet #509

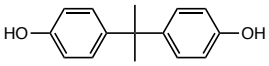
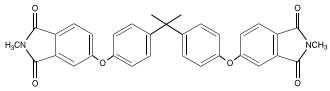
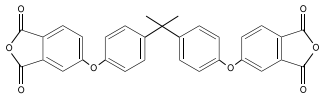
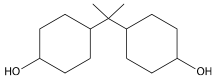
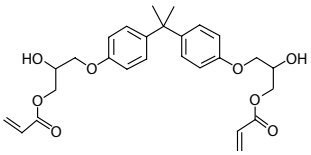
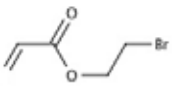
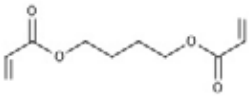


2(5-Benzotriazolyl 3-t-butyl 4-methacryloxy)phenyl propionic acid, isooctyl ester *U6d*	24241-1	1 g

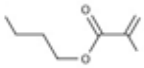
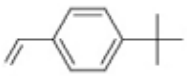
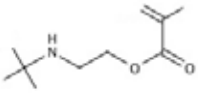
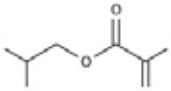
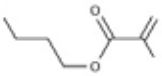
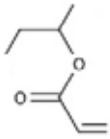
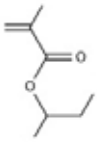
MW 519.66
UV absorbing monomer. Viscous liquid.

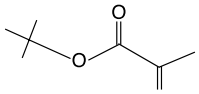
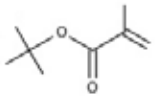


	Catalog #	Size
Benzyl acrylate, ~99% [2495-35-4] *H4g* MW 162.2 bp 100°/118mm Tg 6° n_D^{20} 1.514 150 ppm MEHQ TSCA $C_6H_5CH_2OCO\ CH{=}CH_2$ Used to make polymers of high (~1.55) refractive index.	01997-100	100 g
Benzyl methacrylate, min. 95% [2495-376] *H2d* MW 176.2 bp 231–233° Tg 54° n_D^{20} 1.512 50 ppm MEHQ TSCA $H_2C{=}C(CH_3)CO_2CH_2C_6H_5$ Used to make polymers of high (1.5680) refractive index.	02000-100	100 g
N-Benzylmethacrylamide [3219-55-4] *U2g* MW 175.2 mp 82° $C_6H_5CH_2NHCO\ C(CH_3){=}CH_2$ Used to make polymers of high (1.5965) refractive index.	17969-25	25 g
2,2-Bis[4-(2-acryloxyethoxy)phenyl]propane [64401-02-1] *HO5d* MW 424.5 750 ppm MEHQ TSCA Rigid, hydrophobic, crosslinking monomer.	04136-25	25 g
Bis(2-methacryloxyethyl) N,N'-1,9-nonylene biscarbamate [72869-86-4] *U5d* (Diurethane dimethacrylate) MW 470.6 bp 200° n_D^{20} 1.485 $RCH_2[C(CH_3)(CH_3)CH_2]_2CH_2R$ Long chain-length crosslinking monomer.	21619-50	50 g
Bis(2-methacryloxyethyl) phosphate [32435-46-4] *U4d* MW 322.2 n_D^{20} 1.469 TSCA $[H_2C{=}C(CH_3)CO_2CH_2CH_2O]_2P(O)OH$ Crosslinking monomer. Adhesion promoter through free phosphoric acid group.	16041-10	10 g
2,2-Bis(4-methacryloxyphenyl)propane [3253-39-2] *H2g* MW 364.4 mp 72–74° TSCA $[H_2C{=}C(CH_3)CO_2C_6H_4]_2C(CH_3)_2$ Rigid, hydrophobic, crosslinking monomer.	01381-25	25 g

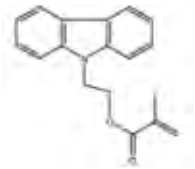
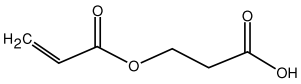
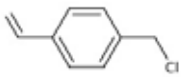
	Catalog #	Size
Bisphenol A [80-05-7] *HO7g* MW 228.3 mp 158–159° bp 220°/4mm TSCA $(CH_3)_2C(C_6H_4OH)_2$ Useful building block to form diacrylates or diglycidylethers for polymerization into engineering plastics, biomedical materials or used as host matrices for conductive materials. (i.e. carbon nanotubes). Used in epoxy resins and polyethers. 	02548-100	100 g
4,4'-Bisphenol A Bis-(N-Methylphthalimide) [54395-52-7] *H4g* MW 546.4 Tg ~67° C Useful in the production of heat resistant polyimides, thermoplastic polyetherimides and special plasticizers. 4,4' isomer ~ 95% solid. 	24284-25	25 g
4,4'-Bisphenol A Dianhydride [38103-06-9] *H4g* MW 520.5 4,4' isomer ~95% solid. Used in the synthesis of high performance polyetherimides and for flame retardant, electrically insulating coatings, non-linear optical applications, for epoxy curing, heat curable, and thermosetting copolymers with silicones. 	24283-25	25 g
Bisphenol A hydrogenated [80-04-6] *HV5g* MW 240.4 mp 154° TSCA Diol, could be used in preparation of all aliphatic epoxy resins, polyethers. 	03474-100	100 g
Bisphenol A-bis(2-hydroxypropyl) acrylate [4687-94-9] MW 484.21 d 1.18 g/cm3 at 25° C ~600 ppm MEHQ Colorless to pale yellow liquid $C_{27}H_{32}O_8$ Hydroxy containing crosslinking monomer. UV curable. Has been used as a component of curable inks, coatings, product varnishes and lacquers. 	25431-50	50 ml
2-Bromoethyl acrylate, min. 95% [4823-47-6] *H5d* MW 179 bp 52–53°/5mm n^{20}_D 1.476 100 ppm MEHQ $BrCH_2CH_2OCOCH{=}CH_2$ Reactive halogen, has potential use in curable and reactive polymers and in synthesis of other monomers. 	02015-10	10 g
1,4-Butanediol diacrylate, min. 85% [1070-70-8] *BH5d* MW 198.2 bp 83°/0.3mm Tg 45° n^{20}_D 1.456 75 ppm MEHQ TSCA $(H_2C{=}CHCO_2CH_2CH_2\text{-})_2$ Crosslinking monomer. 	02049-100	100 g

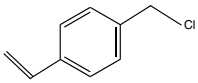
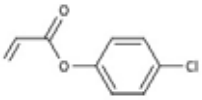
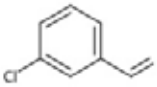
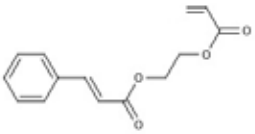
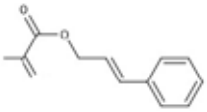
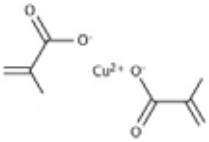
	Catalog #	Size
1,4-Butanediol diglycidyl ether [2425-79-8] *BO6g* MW 202.3 bp 260–266° n_D^{20} 1.453 TSCA For post-crosslinking reactions, preparation of aliphatic epoxy resins. WPE ~130 (83°/0.3mm).	01795-50	50 g
1,3-Butanediol dimethacrylate, 98% [1189-08-8] *EHOV7d* MW 226.3 bp 73°/0.1mm n_D^{20} 1.452 200 ppm MEHQ TSCA $H_2C{=}C(CH_3)CO_2CH_2CH_2CH(CH_3)O_2CC(CH_3){=}CH_2$ Crosslinking monomer.	02047-500	500 g
1,4-Butanediol dimethacrylate, min. 90% [2082-81-7] *HO2d* MW 226.3 bp 132°/4mm n_D^{20} 1.456 200 ppm MEHQ TSCA $[H_2C{=}C(CH_3)CO_2CH_2CH_2\text{-}]_2$ Crosslinking monomer.	05973-250	250 g
3-Butene-1,2,3-tricarboxylic acid [26326-05-6] *U2g* MW 188.1 mp 184–185° Crosslinking monomer. For preparation of alkenyl ester crosslinking monomers.	01396-25 01396-5	25 g 5 g
2-n-Butoxyethyl methacrylate, ~99% [13532-94-0] *H6d* MW 186.2 bp 90–92°/3mm n_D^{20} 1.434 400–500 ppm MEHQ $H_2C{=}C(CH_3)CO_2CH_2CH_2O(CH_2)_3CH_3$ For low Tg polymers having higher polarity than alkyl methacrylate polymers.	02034-100	100 g
4-tert-Butoxystyrene, min. 99% [95418-58-9] *H3g* MW 176.2 bp 72–73°/.3mm n_D^{20} 1.5240 200 ppm TBC TSCA $H_2C{=}CHC_6H_4OC(CH_3)_3$ Hydroxy containing monomer.	21760-10	10 g
n-Butyl acrylate, min. 99% [141-32-2] *BEHJO6d* MW 128.2 bp 43–44°/14mm Tg -54° n_D^{20} 1.418 15–20 ppm MEHQ TSCA $H_2C{=}CHCO_2(CH_2)_3CH_3$ Forms hydrophobic, low Tg polymers soluble in hydrocarbons.	02037-500 02037-3	500 g 3 kg

	Catalog #	Size
n-Butyl methacrylate [97-88-1] *EHOV7d* MW 142.2 bp 162° n_D^{20} 1.423 100 ppm MEHQ Tg 20° TSCA $H_3C(CH_2)_3OCOC(CH_3)=CH_2$ Forms hydrophobic polymers soluble in hydrocarbons. 	02059-250 02059-500	250 g 500 g
4-(tert-Butyl)styrene, 95% [1746-23-2] *EH6d* MW 160.3 bp 219° Tg 132° n_D^{20} 1.526 100 ppm t-butylcatechol TSCA $(CH_3)_3CC_6H_4CH=CH_2$ Higher Tg homolog of styrene, increased solubility in aliphatic hydrocarbons. 	02606-25	25 g
2-(tert-Butylamino)ethyl methacrylate, min. 90% [3775-90-4] *EHO7g* MW 185.3 bp 100–105°/12 mm Tg 33° n_D^{20} 1.442 1100 ppm MEHQ TSCA $H_2C=C(CH_3)CO_2CH_2CH_2NHC(CH_3)_3$ Secondary amine monomer. 	01797-100	100 g
iso-Butyl methacrylate [97-86-9] *CH4d* MW 142.2 bp 154° Tg 53° n_D^{20} 1.420 10–20 ppm MEHQ TSCA $H_2C=C(CH_3)CO_2CH_2CH(CH_3)_2$ Forms hydrophobic polymers soluble in hydrocarbons. 	02056-500	500 g
n-Butyl methacrylate [97-88-1] *EHOV7d* MW 142.2 bp 162° Tg 20° n_D^{20} 1.423 100 ppm MEHQ TSCA $H_3C(CH_2)_3OCOC(CH_3)=CH_2$ Forms hydrophobic polymers soluble in hydrocarbons. 	02059-3	3 kg
sec-Butyl acrylate [2998-08-5] *EHOV7d* MW 128.2 bp 59–60°/50mm Tg 12° C n_D^{20} 1.414 100 ppm MEHQ TSCA Hydrophobic acrylate ester having Tg similar to the less hydrophobic ethyl acrylate. 	02038-25	25 g
sec-Butyl methacrylate [2998-18-7] *CU4d* MW 142.2 bp 146° Tg 60° 100 ppm MEHQ $H_3CCH_2CH(CH_3)OCOC(CH_3)=CH_2$ Forms hydrophobic polymers soluble in hydrocarbons. 	02057-10	10 g

	Catalog #	Size
tert-Butyl acrylate [1663-39-4] *CH6d* MW 128.2 bp 30–31°/26mm Tg 43° n_D^{20} 1.411 10–20 ppm MEHQ TSCA $H_2C{=}CHCO_2C(CH_3)_3$ Forms hydrophobic polymers. Polymers are easily transesterified and thermally eliminate isobutene to form acid groups. 	02039-250	250 g
tert-Butyl methacrylate [585-07-9] *CU6g* MW 142.2 bp 65–66°/57mm Tg 107° n_D^{20} 1.415 200 ppm MEHQ TSCA $H_2C{=}C(CH_3)CO_2C(CH_3)_3$ Polymer easily transesterified, thermally eliminates isobutene to form acid groups. 	02058-100	100 g
n-Butyltrimethoxysilane [1067-57-8] *EH5g* MW 178.3 bp bp 164–165° n_D^{20} 1.398 TSCA $H_3C(CH_2)_3Si(OCH_3)_3$ Hydrophobic siloxane monomer. Produces crosslinks in polysiloxanes	21094-250	250 g

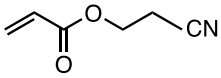
C

2-(9H-Carbazole-9-yl) ethyl methacrylate [15657-91-7] *HO5d* MW 297.33 mp 82–84° C n_D^{20} 1.69 Analog of photoconductive polymer, N-Vinylcarbazole. UV λ max: 241nm 	24372-1	1 g
β-Carboxyethyl Acrylate, >98% Active [24615-84-7] *BHM4d* MW 144 1,000 ppm MEHQ Slightly Viscous Liquid $CH_2{=}CHCO_2(CH_2)_2CO_2H$ A high purity material is in the class of carboxylic monomers of the acrylic or methacrylic acid type. A significant difference is the greater separation of the carboxylic acid functionality from the polymerizable vinyl functionality. Can be polymerized in solution or emulsion to produce acrylic, vinyl-acrylic or styrenic-acrylic polymers with improved adhesive properties. 	24891-100	100 g
Other key differences compared to conventional carboxylic acid functional materials are: • Promotes flexibility in polymers owing to lower glass transition of its homopolymers (< 30° C) • Provides improved adhesion and stability in emulsion polymers, due to its -COOH groups being more available than those in the conventional carboxylic acids • Much more reactive in its salt form than acrylic acid, allowing high levels of incorporation, over a wide pH range • More compatible with other monomers, thus reducing aqueous phase polymerization and producing more uniform copolymers		
4-Chloromethylstyrene [1592-20-7] *BHO6g* (4-vinylbenzyl chloride) MW 152.6 bp ~229° 500 ppm t-butylcatechol, ppm nitroparaffin TSCA $H_2C{=}CHC_6H_4CH_2Cl$ Reactive styrene monomer. Can be used to prepare Merrifield resins without using a chloromethylation step. 	22193-25	25 g

	Catalog #	Size
Chloromethylstyrene, 43% para, 57% meta, ~96% [30030-25-2] *BH6d* (vinylbenzyl chloride) MW 152.6 bp 229° n_D^{20} 1.570 50–100 ppm t-butylcatechol 700-900 ppm nitroparaffin TSCA $H_2C{=}CHC_6H_4CH_2Cl$ Reactive styrene monomer. Can be used to prepare Merrifield resins without using a chloromethylation step. 	02718-100 02718-500	100 g 500 g
4-Chlorophenyl acrylate [13633-87-9] *U4d* MW 182.6 bp 70°/1mm Tg 58° n_D^{20} 1.536 100 ppm HQ $4\text{-}ClC_6H_4OCOCH{=}CH_2$ Higher refractive index (n = ~1.55) than most acrylate esters. 	01331-10	10 g
3-Chlorostyrene, 98% [2039-85-2] *EH4d* MW 138.6 mp 62°/6mm Tg 90° n_D^{20} 1.562 0.1% BHT $H_2C{=}CHC_6H_4Cl$ Can be used in synthesis of other styrene monomers, high refractive index (~1.6) polymers. 	02042-5	5 g
2-Cinnamoyloxyethyl acrylate [52049-17-9] *HO4d* MW 202.3 n_D^{20} 1.562 200 ppm MEHQ $C_6H_5CH{=}CHCO_2CH_2CH_2OCOCH{=}CH_2$ Photocrosslinking monomer. 	24014-10	10 g
Cinnamyl methacrylate [31736-34-2] *U5d* MW 202.3 bp 141°/3mm n_D^{20} 1.446 100 ppm MEHQ $C_6H_5CH{=}CHCH_2OCOC(CH_3){=}CH_2$ Photocrosslinking monomer. 	02092-5	5 g
Copper (II) methacrylate [53721-10-1] *X7d* MW 233.7 $[H_2C{=}C(CH_3)CO_2]_2Cu$ Metal salt of methacrylic acid. 	21222-25	25 g

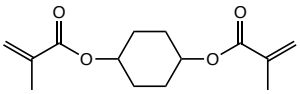
	Catalog #	Size
2-Cyanoethyl acrylate [106-71-8] *BOVW6bd*	01829-100	100 g

MW 125.1 bp 90°/5mm Tg 4° n^{20}_{D} 1.447 400–800 ppm MEHQ TSCA
Polar acrylate ester used in a wide range of applications including photocurable resists for liquid crystal devices, photocurable polymer insulators for multilayer circuitry, electroluminescent products, graft polymers for controlled diffusion, vulcanization of rubbers and as an adhesion promoter.



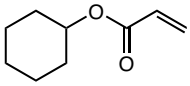
trans-1,4-Cyclohexanediol dimethacrylate [38479-34-4] *EHOV7d*	18912-10	10 g

MW 252.3 Light yellow liquid
Crosslinking monomer.



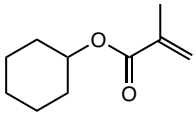
Cyclohexyl acrylate, min 85% [3066-71-5] *U7d*	02109-100	100 g

MW 154.1 bp 182–184° Tg 19° n^{20}_{D} 1.467 200 ppm MEHQ TSCA
Bulky alkyl acrylate ester.



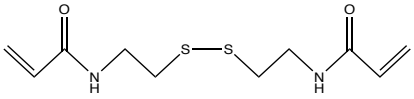
Cyclohexyl methacrylate, ~98% [101-43-9] *EH4d*	01837-100	100 g

MW 168.2 bp 71–74°/5mm Tg 83° n^{20}_{D} 1.459 50 ppm MEHQ, 2 ppm phenothiazine TSCA
$H_2C{=}C(CH_3)CO_2C_6H_{11}$
Bulky alkyl methacrylate ester.



N,N'-Cystaminebisacrylamide, Electro Pure™ [60984-57-8] *U6f*	09809-5	5 g

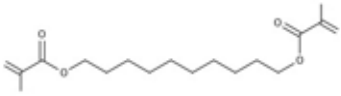
MW 260.4 mp 120–125°
Reversible crosslinking monomer. Can be used to introduce mercaptan groups into polymers by reducing to mercaptan after polymerization. Requires Dry Ice



D

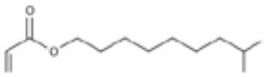
1,10-Decanediol dimethacrylate [6701-13-9] *EHOU6d*	02140-25	25 g

MW 310.4 bp 170°/2mm n^{20}_{D} 1.458 270 ppm HQ TSCA
$[H_2C{=}C(CH_3)CO_2(CH_2)_5]_2$
Hydrophobic, long-chain crosslinking monomer.



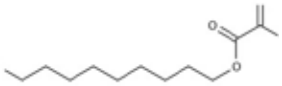
iso-Decyl acrylate [1330-61-6] *H4d*	03008-100	100 g

MW 212.3 bp 121°/10mm Tg -55° n^{20}_{D} 1.440 50 ppm MEHQ TSCA
$H_2C{=}CHCO_2C_{10}H_{21}$
Hydrophobic ester monomer. Forms hydrocarbon-soluble polymers.



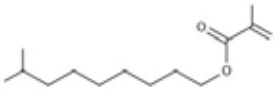
	Catalog #	Size
n-Decyl methacrylate, 99% [3179-47-3] *U5d*	23344-25	25 g

MW 226.4 bp 155–156°/22mm Tg -30° n_D^{20} 1.443 100 ppm MEHQ TSCA
$H_3C(CH_2)_9OCOC(CH_3)=CH_2$
High-purity hydrophobic ester monomer, forms oil-soluble polymers.



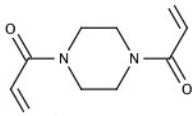
iso-Decyl methacrylate, min. 90% [29964-84-9] *H5g*	22493-100	100 g

MW 226.3 bp 78°/1mm n_D^{20} 1.441 100ppm HQ inhibitor TSCA
$H_2C=C(CH_3)CO_2C_{10}H_{21}$
Hydrophobic ester monomer, forms oil-soluble polymers.



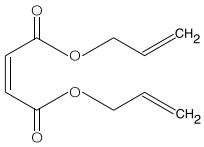
1,4-Diacryloylpiperazine [6342-17-2] *H5d*	21190-10	10 g

MW 194.2 mp 90–92°
Acrylamide-based crosslinking monomer.



Diallyl Maleate [999-21-3] *HV4d*	02156-250	250 g

MW 196.2 mp -47° C (lit.) bp 160–116° C/4mm Hg (lit.)
n_D^{20} 1.469 d 1.073g/ml (lit.) 230° C TSCA
$CH_2=CHCH_2OCOCH=CHCOOCH_2CH=CH_2$
Reactive functional monomer. Polymers formed with the incorporation of Diallyl Maleate have pendant allyl groups. Applications for Diallyl Maleate include polyester resins, adhesives, and ion exchange resins. When used at low levels, Diallyl Maleate is an effective agent for the promotion of branching in emulsion polymers.

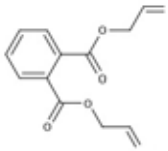


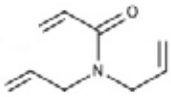
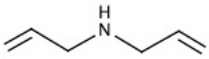
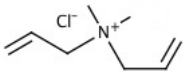
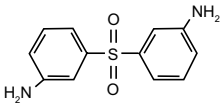
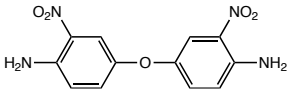
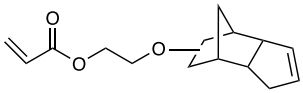
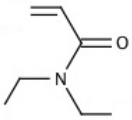
Diallyl Maleate–99% Active [999-21-3] *H4d*	24892-100	100 g

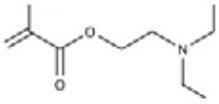
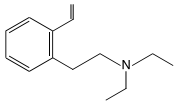
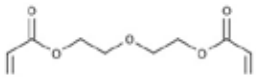
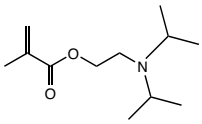
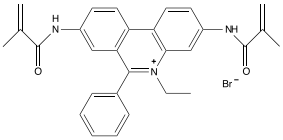
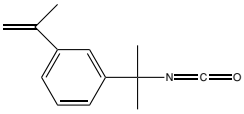
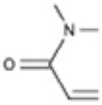
MW 196 Clear Liquid
$CH_2=CHCH_2OCOCH=CHCOOCH_2CH=CH_2$
Moisture (%): 0.05 Diallyl ester of maleic acid. Once polymerized through the vinyl center adjacent to the ester groups, it provides multiple postfunctionalization target sites at the pendant allylic centers. This makes it particularly useful both in acrylic chemistry but also in combination with alkyd and polyester resins. When employed at very low levels it is an effective site for branching generation in emulsion polymers.

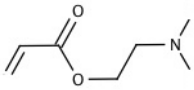
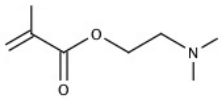
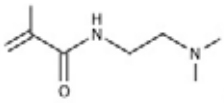
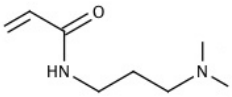
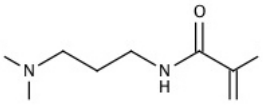
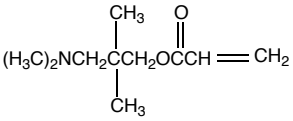
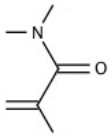
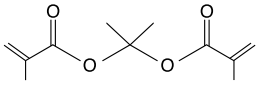
Diallyl phthalate, practical [131-71-9] *I7g*	02159-1	1 kg

MW 246.3 bp 161–163°/5mm n_D^{20} 1.5190
C_6H_4-1,2-$(CO_2CH_2CH=CH_2)_2$
Crosslinking monomer producing considerable cyclic structures.



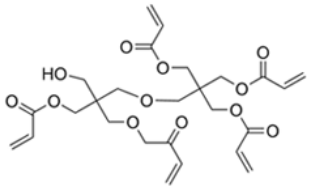
	Catalog #	Size
N,N-Diallylacrylamide [3085-68-5] *U7d* MW 151.2 bp 108–110°/3mm n_D^{20} 1.489 100 ppm HQ $(H_2C{=}CHCH_2)_2NCOCH{=}CH_2$ Crosslinking monomer. 	01848-10	10 g
Diallylamine, min. 98% [124-02-7] *IWX7g* MW 97.2 bp 110° n_D^{20} 1.440 TSCA $(H_2C{=}CHCH_2)_2NH$ Forms soluble cyclopolymers. 	21424-100	100 g
Diallyldimethylammonium chloride, 65% soln. in water [7398-69-8] *H4g* MW 161.7 TSCA $(H_2C{=}CHCH_2)_2N(CH_3)_2Cl$ For preparation of linear all-aliphatic cationic polymers by cyclopolymerization mechanism. 	15912-100	100 g
3,3′-Diaminodiphenyl sulfone, min 98% [599-61-1] *EJU4g* MW 248 mp 171–172° TSCA $(H_2NC_6H_4)_2SO_2$ Preparation of polyamides, polyimides. 98% (contains 3,4′-isomer) 	21393-50	50 g
4,4′-Diamino-3,3′-dinitrodiphenyl ether [3273-78-7] *U5d* MW 290.2 mp 296° $C_{12}H_{10}N_4O_5$ Preparation of polyamides, polyimides. 	16685-10	10 g
Dibutyltin dilaurate [77-58-7] *BH6g* MW 631.6 mp 24° bp 205° n_D^{20} 1.470 d 1.066 Yellowish liquid TSCA $[CH_3(CH_2)_{10}CO_2]_2Sn[(CH_2)_3CH_3]_2$ Catalyst for polymerizing lactide and glycolide and isocyanate reactions.	01862-50	50 g
Dicyclopentenyloxyethyl acrylate [65983-31-5] *HOV7d* MW 248.3 bp 113°/1mm Tg 11° n_D^{20} 1.501 700 ppm MEHQ TSCA Double bond in dicyclopentenyl does not participate in polymerization but can be post-reacted, e.g., by oxidative crosslinking. 	15797-25	25 g
N,N-Diethylacrylamide, min. 95% [2675-94-7] *U4d* MW 127.2 bp 93°/19mm n_D^{20} 1.464 100 MEHQ $(C_2H_5)_2NCOCH{=}CH_2$ Substituted acrylamide monomer. 	00871-25	25 g

	Catalog #	Size
2-(N,N-Diethylamino)ethyl methacrylate [105-16-8] *EHO5g* MW 185.3 bp 90–92°/3mm Tg 20° n_D^{20} 1.444 100 ppm PTZ TSCA $H_2C{=}C(CH_3)CO_2CH_2CH_2N(C_2H_5)_2$ Preparation of cationic polymers, especially quaternary ammonium polymers. 	01872-500	500 g
2-(Diethylamino)ethylstyrene, mixed m,p-isomers, min. 95% [74952-73-1] *U5d* MW 203.3 bp 75–85°/1mm Hg n_D^{20} 1.443 100 ppm MEHQ Amine-functional styrene monomer. 	24100-5	5 g
Diethylene glycol diacrylate [4074-88-8] *BOW6d* MW 214.2 bp 200°/760mm n_D^{20} 1.463 120 ppm MEHQ TSCA $(H_2C{=}CHCO_2CH_2CH_2)_2O$ Hydrophilic crosslinking monomer. 	02215-100	100 g
Diethylene glycol dimethacrylate [2358-84-1] *H4g* MW 242.3 bp 200°/760mm n_D^{20} 1.458 500 ppm MEHQ TSCA $[H_2C{=}C(CH_3)CO_2(H_2CH_2]_2O$ Hydrophilic crosslinking monomer.	02214-100	100 g
2-Diisopropylaminoethyl methacrylate [16715-83-6] *U5d* MW 213.3 bp 70–75°/1mm n_D^{20} 1.449 Amine containing monomer. For preparation of polymers containing tertiary amine functionality. 	24263-10	10 g
3,8-Dimethacryloyl ethidium bromide *U4ag* (5-ethyl-3,8-dimethacrylamido-6-phenylphenanthridinium bromide; PolyFluor® 512) MW 530.2 mp 245.5–247° Orange crystals Fluorescent monomer. 	23590-100 23590-1	100 mg 1 g
3-Isopropenyl-α,α-dimethylbenzyl Isocyanate [2094-99-7] *HO5g* MW 201.3 bp 268–271° n_D^{20} 1.530 0.01% BHT TSCA $H_2C{=}C(CH_3)C_6H_4C(CH_3)_2NCO$ Aliphatic isocyanate monomer. 	19706-100	100 g
N,N-Dimethylacrylamide, min. 98% [2680-03-7] *ESVW5d* MW 99.1 bp 82–84°/21mm Tg 89° n_D^{20} 1.473 500 ppm MEHQ TSCA $H_2C{=}CHCON(CH_3)_2$ Water-soluble, hydrolytically stable acrylamide derivative used in chromatographic resins. Requires Poison Pack 	02255-100	100 g

	Catalog #	Size
2-(N,N-Dimethylamino)ethyl acrylate [2439-35-2] *EHOV7d* MW 143.1 bp 53°/3mm n_D^{20} 1.438 1000 ppm MEHQ TSCA $H_2C{=}CHCO_2CH_2CH_2N(CH_3)_2$ For preparation of cationic polymers, especially quaternary ammonium polymers. 	02257-500	500 g
2-(N,N-Dimethylamino)ethyl methacrylate, min. 99% [2867-47-2] *HO6d* MW 157.2 bp 75–77°/13mm Tg 19° n_D^{20} 1.440 d 0.933 g/mL at 25°C 1000 ppm MEHQ TSCA $H_2C{=}C(CH_3)CO_2CH_2CH_2N(CH_3)_2$ For preparation of cationic polymers, especially quaternary ammonium polymers. Requires Poison Pack Technical Data Sheet #213 	00213-500	500 g
N-[2-(N,N-Dimethylamino)ethyl]methacrylamide [13081-44-2] *U6d* MW 156.3 bp 87°/1.8mm n_D^{20} 1.474 100 ppm HQ $(H_3C)_2NCH_2CH_2NHCOC(CH_3){=}CH_2$ Amine-functional methacrylamide derivative. 	06172-5	5 g
N-[3-(N,N-Dimethylamino)propyl]acrylamide, min.95% [3845-76-9] *U6d* MW 156.2 bp 85°/.01mm Tg 19° n_D^{20} 1.482 Hg uninhibited $(H_3C)_2N(CH_2)_3NHCOCH{=}CH_2$ For preparation of cationic polymers, especially quaternary ammonium polymers. 	22018-10	10 g
N-[3-(N,N-Dimethylamino)propyl]methacrylamide [5205-93-6] *BH4g* MW 170.3 bp 141°/2mm n_D^{20} 1.479 600–750 ppm MEHQ TSCA $H_2C{=}C(CH_3)CONH(CH_2)_3N(CH_3)_2$ For preparation of cationic polymers, especially quaternary ammonium polymers. Monomer is more hydrolytically stable than corresponding esters. 	09656-100	100 g
3-Dimethylaminoneopentyl acrylate *EHVWX6d* MW 185.3 bp 53°/1.4mm n_D^{20} 1.439 100 MEHQ Amine containing monomer. For preparation of polymers containing tertiary amine functionality. 	17970-10	10 g
N,N-Dimethylmethacrylamide [6976-91-6] *U4d* MW 113.2 bp 65–67°/10mm n_D^{20} 1.460 100 ppm MEHQ $(H_3C)_2NHCOC(CH_3){=}CH_2$ Substituted amide monomer. 	02270-25	25 g
2,2-Dimethylpropanediol dimethacrylate [1985-51-9] *EHOV7d* MW 240.3 bp 112°/1.2mm n_D^{20} 1.453 60 ppm MEHQ TSCA $[H_2C{=}C(CH_3)CO_2CH_2]_2C(CH_3)_2$ Crosslinking monomer. 	02276-100	100 g

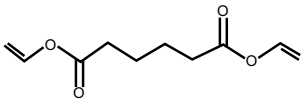
	Catalog #	Size
Dipentaerythritol pentaacrylate (mixture of tetra-, penta-, hexaacrylate) [60506-81-2] *HO5g* . .	16311-500	500 g

MW 524.5 Tg 90° n_D^{20} 1.490 270 ppm MEHQ TSCA
$O[CH_2C(CH_2OR)_{23}]_2$ R=COCH=CH_2
Highly efficient crosslinking monomer, used especially in UV curing coatings.



Divinyl Adipate [4074-90-2]	25338-100	100 g

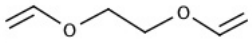
MW 198.22 mp 28° C (freezing point) MEHQ
$C_{10}H_{14}O$
Divinyl adipate is a reactive double vinyl ester that can be used as a crosslinker to crosslink hydroxyl containing polymers. It has been used to synthesize biodegradable hydrogels and other crosslinked biodegradable polymers.



1. "Enzyme-Catalyzed Polycondensation of Polyester Macrodiols with Divinyl Adipate: A Green Method for the Preparation of Thermoplastic Block Copolyesters" Dai, S.; et al. Biomacromolecules, 2009, 10 (12), pp 3176–3181 2. "Facile Preparation of Biodegradable Glycol Chitosan Hydrogels Using Divinyladipate as a Crosslinker" Kim, B.S.; et al. Macromolecular Research, Vol. 17, No. 10, pp 734-738 (2009)

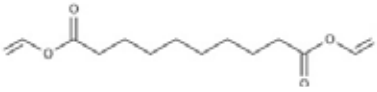
Divinyl glycol [1069-23-4] *H4g*	18252-25	25 g

(1,5-hexadiene-3,4-diol) MW 114.1 bp 89–90°/8mm
n_D^{20} 1.479 0.25% BHT
H_2C=CHCH(OH)CH(OH)CH=CH_2
Crosslinking monomer.

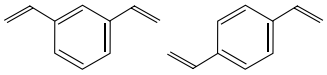


Divinyl sebacate [10355-50-7] *A2d*	04632-5	5 g

MW 254.3 bp 142–144°/3mm n_D^{20} 1.454 120 ppm HQ
$[H_2C=CHO_2C(CH_2)_4]_2$
Crosslinking vinyl ester monomer.



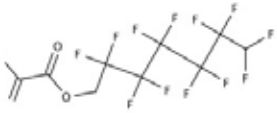
Divinylbenzene [1321-74-0] *H5d*
MW 130.2 bp 198° n_D^{20} 1.574 ~1000 ppm t-butylcatechol inhibitor TSCA
$C_6H_4(CH=CH_2)_2$
Crosslinking monomer used primarily with styrene.



80% Active	22478-100	100 g
50–60% Active meta/para ratio 2.3:1	01892-100	100 g

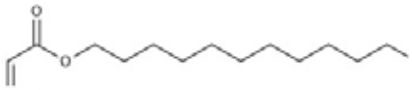
1H,1H,7H-Dodecafluoroheptyl methacrylate [2261-99-6] *EHOV7d*	00767-25	25 g

MW 400.2 bp 107°/23mm Tg 13° n_D^{20} 1.349 120 ppm HQ
$H_2C=C(CH_3)CO_2CH_2(CF_2)_6H$
Low refractive index polymers (~1.36).



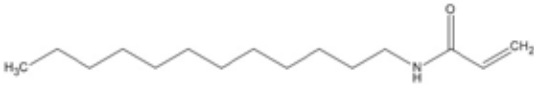
	Catalog #	Size
n-Dodecyl acrylate [2156-97-0] *U5g*	02460-50	50 g

MW 240.4 bp 119°/0.8mm Tg -3° n_D^{20} 1.445 200 ppm MEHQ TSCA
$H_2C{=}CHCO_2(CH_2)_{11}CH_3$
Forms hydrophobic polymers soluble in hydrocarbons.



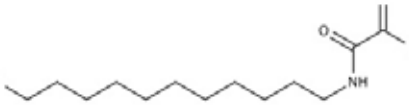
New! N-Dodecylacrylamide [1506-53-2] *U4g*	25723-5	5 g
	25723-25	25 g

MW 239.4 mp 58° C bp 155° C Solid
Long-chain amide monomer.



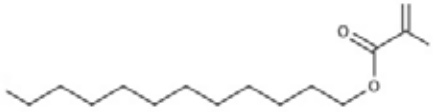
N-Dodecylmethacrylamide [1191-39-5] *U5g*	04135-10	10 g

MW 253.4 mp 41° bp 145°/0.08mm Tg 15°
Hydrophobic, long-chain alkyl-substituted amide monomer.



n-Dodecyl methacrylate [142-90-5] *H2g*	02461-250	250 g

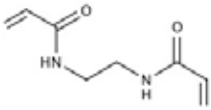
MW 254.4 bp 142–143°/2mm Tg -55° n_D^{20} 1.445 400 ppm MEHQ, 5 ppm HQ TSCA
$H_2C{=}C(CH_3)CO_2(CH_2)_{11}CH_3$
Preparation of hydrophobic polymers.



E

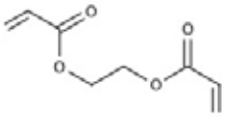
N, N' Ethylene Bisacrylamide [2656-58-3] *HU2d*	09811-1	1 g

MW 168.2 mp 141–143° C
$C_8H_{12}N_2O_2$
Crosslinking monomer used in the preparation of polyacrylamide resins.



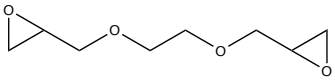
Ethylene glycol diacrylate [2274-11-5] *EHOV7d*	02302-25	25 g

MW 170.2 bp 62°/0.9mm n_D^{20} 1.453 100 ppm MEHQ TSCA
$(H_2C{=}CH(O_2CH_2\text{-})_2$
Crosslinking monomer.



Ethylene glycol diglycidyl ether (Quetol 651) [2224-15-9] *H5g*	01479-100	100 g

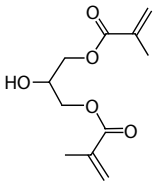
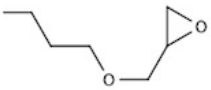
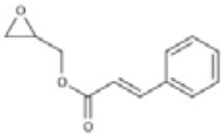
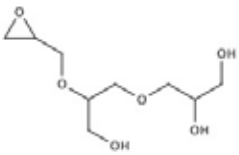
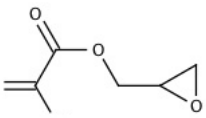
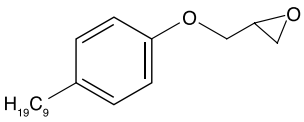
MW 174.2 bp 112°/4.5mm n_D^{20} 1.463 TSCA
Crosslinker for carboxyl-, amine- and hydroxyl- functional polymers. Material is ~100% active and contains higher molecular weight compounds having chloropropylene segments produced by reaction with more than one epichlorohydrin molecule per hydroxyl in synthesis.
Histochemical Journal, 20, 222 (1988)



	Catalog #	Size
Ethylene glycol dimethacrylate, min 88% [97-90-5] *U6d* bp 83–85°/1mm n_D^{20} 1.454 70 ppm HQ $[H_2C{=}C(CH_3)CO_2CH_2\text{-}]_2$ Useful as a high purity crosslinker with bridging capability between polymer chains.	02303-250	250 g
Ethylene glycol dimethacrylate, min 98% [97-90-5] *HJ6g* bp 83–85°/1mm n_D^{20} 1.454 100 ppm MEHQ $[H_2C{=}C(CH_3)CO_2CH_2\text{-}]_2$ Useful as a high purity crosslinker with bridging capability between polymer chains.	24030-250	250 g
Ethylene glycol dimethacrylate, 99.7% [97-90-5] *HO2d* MW 198 50 ppm MEHQ Clear Liquid $[H_2C{=}C(CH_3)CO_2CH_2\text{-}]_2$ High purity monomer for contact lens applications. Useful as a high purity crosslinker with bridging capability between polymer chains.	24896-250	250 g
2-Ethylhexyl acrylate [103-11-7] *EH5d* MW 184.3 bp 128–129°/50mm Tg -50° n_D^{20} 1.436 50 ppm MEHQ TSCA $H_2C{=}CHCO_2CH_2CH(C_2H_5)(CH_2)_3CH_3$ Hydrophobic, low Tg, monomer used as internal plasticizer for polymers of other, high Tg, monomers.	00587-250	250 g
N-Ethylmethacrylamide [7370-88-9] *EI7d* MW 113.2 bp 106°/4mm $H_3CCH_2NHCOC(CH_3){=}CH_2$ Solvent-soluble, polymerizable amide.	02322-10	10 g
2-(2-Ethoxyethoxy)ethyl acrylate [7328-17-8] *HO4d* MW 188.2 bp 250° Tg -70° n_D^{20} 1.440 1000 ppm MEHQ plus 5 ppm HQ TSCA $H_2C{=}CHCO_2(CH_2CH_2O)_2C_2H_5$ Polar, hydrophilic, monomer, low volatility, low Tg. Higher polarity than n-octyl acrylate.	02626-100	100 g

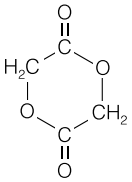
F

Fluorescein dimethacrylate *U5ad* (3′,6′-dimethacryloxyspirobenzo[c]-furan[1,9′]xanthen-3-one; PolyFluor® 511) MW 468.4 mp 154.5–156° Off-white crystals Fluorescent monomer.	23589-100 23589-1	100 mg 1 g

	Catalog #	Size
G		
Glycerol monomethacrylate, mixture of isomers [5919-74-4] *HO5f* MW 160.2 bp 140°/0.6mm n_D^{20} 1.470 4000 ppm MEHQ TSCA Hydrophilic monomer useful in hydrogel preparation.	04180-12 04180-25	12 g 25 g
1,3-Glyceryl dimethacrylate [1830-78-0; 28497-59-8] (Bis(methacryloxy)propanol) MW 228.24 d 1.12 g/ml Clear, Colorless to light yellow liquid $C_{11}H_{16}O_5$ 	25420-50	50 ml
Glycidyl butyl ether [2426-08-6] *HW7g* (2,3-Epoxypropyl butyl ether) MW 130.2 bp 164–166° n_D^{20} 1.419 TSCA For modification of carboxyl-,amine-, and hydroxyl- function polymers. Additive used to reduce viscosity in epoxy embedding resins. 	05678-500	500 g
Glycidyl cinnamate [19532-86-6] *HU7g* MW 204.2 bp 180–183°/3mm n_D^{20} 1.575 Can be reacted with groups such as hydroxyl, amine or carboxyl to introduce photocrosslinkable sites. 	16090-10	10 g
Glycidyl Glycerol-Ether, Polyfunctional [25038-04-4] *H4g* TSCA Effective crosslinker for hydroxyl-, amine-, and carboxylic acid-functional polymers. WPA 140-160. 	09221-50	50 g
Glycidyl methacrylate [106-91-2] *BEV7d* MW 142.2 bp 182° Tg 41° n_D^{20} 1.449 100 ppm MEHQ TSCA Reactive ester monomer for preparation of other monomers and introduction of reactive sites into polymers. 	02607-500	500 g
Glycidyl nonylphenyl ether *U4g* MW 276.4 Reactive hydrophobic ether. Min. 87% WPE 330. 	18236-100	100 g

	Catalog #	Size
Glycolide, 99.9% [502-97-6] *B6bf*	17085-10	10 g
	17085-50	50 g

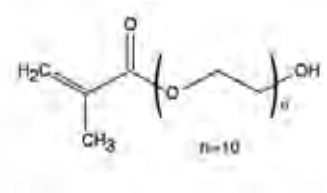
MW 116.1 mp 84° TSCA



H

(HEMA 10) Poly Ethoxy (10) ethyl methacrylate [25736-86-1] *H5ad* — 24890-100 — 100 g

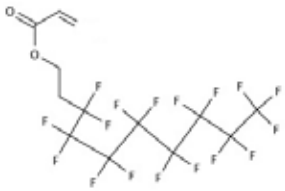
MW 526 800 ppm Viscous Liquid
Ethylene oxide, moles: 10 Active content (%): 90 Moisture content (%): 0.5 Hydroxyl number (meq KOH/mg): 98
This homolog of HEMA bears 10 ethoxy units on the ester linkage. These water soluble pendant, nonionic side chains not only increase water compatibility in the polymer but can enhance stabilization of latex systems alone or in combination with added non-ionic surfactants.



1H,1H,2H,2H-Heptadecafluorodecyl acrylate [27905-45-9] *BHO6d*

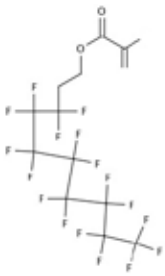
	19227-25	25 g
	19227-100	100 g

MW 518.2 bp 100°/4mm Tg 0° n_D^{20} 1.337 100 ppm MEHQ TSCA
$H_2C{=}CHCO_2CH_2CH_2(CF_2)_7CF_3$
Low refractive index monomer. Polymer RI: ~1.34



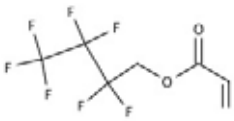
1H,1H,2H,2H-Heptadecafluorodecyl methacrylate [1996-88-9] *BHO6d* — 19226-25 — 25 g

MW 532.2 bp 110°/4mm Tg 40° n_D^{20} 1.343 100 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CH_2(CF_2)_7CF_3$
Low refractive index monomer. Polymer RI: ~1.35



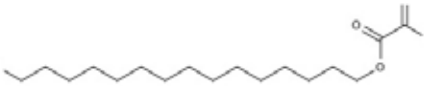
1H,1H-Heptafluorobutyl acrylate [424-64-6] *H6g* — 21039-25 — 25 g

MW 254.1 bp 57°/30mm Tg -30° n_D^{20} 1.331 100 ppm MEHQ TSCA
$H_2C{=}CHCO_2CH_2CF_2CF_2CF_3$
Low refractive index monomer. Polymer n = 1.367



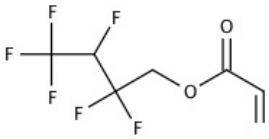
1-Hexadecyl methacrylate [2495-27-4] *EHOV7d* — 02396-25 — 25 g

MW 310.5 Tg 22° n_D^{20} 1.341 100 ppm HQ TSCA
Highly hydrophobic ester monomer.

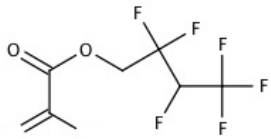


	Catalog #	Size
1H,1H,3H-Hexafluorobutyl acrylate [54052-90-3] *CHO5d*	05631-10	10 g
1H,1H,3H-Hexafluorobutyl methacrylate [36405-47-7] *EHO5d*	05632-10	10 g
Bis-(1,1,1,3,3,3-Hexafluoroisopropyl) Itaconate [98452-82-5] *HU4d*	24971-25	25 g
1,1,1,3,3,3-Hexafluoroisopropyl Acrylate [2160-89-6] *CH7d*	24970-25	25 g
Hexafluoro-iso-propyl methacrylate [3063-94-3] *CH6g*	02401-10	10 g

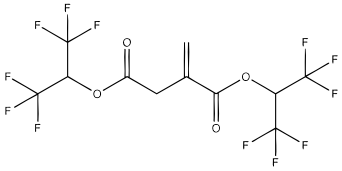
1H,1H,3H-Hexafluorobutyl acrylate [54052-90-3] *CHO5d*
MW 236.1 bp 48°/12mm Tg -22° n^{20}_{D} 1.352 100 ppm HQ
$H_2C{=}CHCO_2CH_2CF_2CH(F)CF_3$
Low refractive index monomer. Polymer RI: 1.392



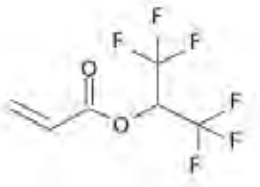
1H,1H,3H-Hexafluorobutyl methacrylate [36405-47-7] *EHO5d*
MW 250.2 bp 159° n^{20}_{D} 1.361 100 ppm HQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CF_2CH(F)CF_3$
Low refractive index monomer. Polymer RI: ~1.40



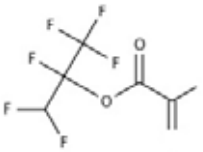
Bis-(1,1,1,3,3,3-Hexafluoroisopropyl) Itaconate [98452-82-5] *HU4d*
Bis-(Hexafluoroisopropyl) Itaconate MW 430.14 bp 75–77° @ 12mm n^{20}_{D} 1.33 d 1.54 grams/mL Clear, colorless liquid TSCA
$C_{11}H_6F_{12}O_4$
Fluoromonomer useful in producing polymers for the formulation of plastics with high performance and unique strength and durability. Fluoropolymers created from fluoromonomers are high value added materials with unique properties including chemical and heat resistance and the ability to withstand corrosion. Products made from fluoropolymers include surfactants, optical fibers, biomaterials, coatings for nonstick bakeware and membranes for fuel cells.



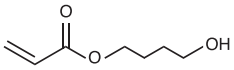
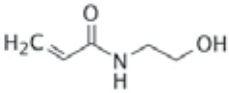
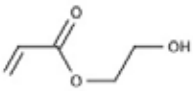
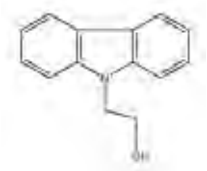
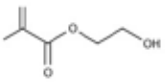
1,1,1,3,3,3-Hexafluoroisopropyl Acrylate [2160-89-6] *CH7d*
MW 222.09 bp 65–68° @ 165mm n^{20}_{D} 1.319 d 1.33 grams/mL 10° C / 50° C 200 ppm of MEHQ Clear, colorless liquid
$H_2C{=}CHCO_2CH(CF_3)_2$
Fluoromonomer useful in producing polymers for the formulation of plastics with high performance and unique strength and durability. Fluoropolymers created from fluoromonomers are high value added materials with unique properties including chemical and heat resistance and the ability to withstand corrosion. Products made from fluoropolymers include surfactants, optical fibers, biomaterials, coatings for nonstick bakeware and membranes for fuel cells. Requires Cold Pack



Hexafluoro-iso-propyl methacrylate [3063-94-3] *CH6g*
MW 236.1 bp 50°/140mm n^{20}_{D} 1.331 50 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH(CF_3)_2$
Low refractive index monomer. Polymer RI: ~1.38



	Catalog #	Size
N,N'-Hexamethylenebisacrylamide [7150-41-6] *U7d* MW 224.2 mp 135-145° C $[H_2C{=}CHCONH(CH_2)_3]_2$ Crosslinking amide monomer, greater hydrolytic stability than corresponding esters. May contain insoluble impurity. If desired, filter before using.	01495-5	5 g
1,6-Hexanediol diacrylate [13048-33-4] *HO4g* MW 226.3 bp 295° Tg 43° n^{20}_D 1.456 HQ(HPLC) 75–125 ppm, MEHQ 0–45 ppm TSCA $[H_2C{=}CHCO_2(CH_2)_3\text{-}]_2$ Crosslinking monomer.	23671-100	100 g
1,6-Hexanediol dimethacrylate, min 98% [6606-59-3] *HO5g* MW 254.3 bp >315° n^{20}_D 1.458 100 ppm HQ TSCA $[H_2C{=}C(CH_3)CO_2(CH_2)_3\text{-}]_2$ Crosslinking monomer.	23672-100	100 g
n-Hexyl acrylate, min. 98% [2499-95-8] *EHOV7d* MW 156.2 bp 190° Tg -45° n^{20}_D 1.428 85 ppm HQ TSCA $CH_2{=}CHCO_2(CH_2)_5CH_3$ Hydrophobic, low Tg, ester monomer.	02411-100	100 g
2,2-Bis[4-(2-hydroxy-3-methacryloxypropoxy)phenyl]propane [1565-94-2] *A2d* (Bis-GMA) MW 510.6 bp Gels before boiling n^{20}_D 1.550 100 ppm MEHQ TSCA $[H_2C{=}C(CH_3)CO_2CH_2CH(OH)CH_2OC_6H_4\text{-}4\text{-}]_2$ Rigid, hydrophobic, Crosslinking monomer.	03344-100 03344-500	100 g 500 g
2-(2'-Hydroxy-5'-methylphenyl)-benzotriazole [244-22-4] *HO4g* (Tinuvin P®) MW 225.2 mp 128–132° d 1.40 yellow granules A highly efficient UV absorbent *(absorbs UV between 270-340nm)* used in polystyrene, polyester, polycarbonate, Perspex, polyethylene, ABS resin, epoxy resin and cellulose resin. Absorbs almost no visible light, making it useful for colorless transparent and pale colored products. Can be used in plastic products for food.	21363-25	25 g
2-hydroxy-3-chloropropyl methacrylate [13159-52-9] MW 178.61 bp 108° C/5 mmHg d 1.20 g/mL Clear, colorless to slightly pale liquid $C_7H_{11}ClO$ Stabilized with HQ aka: Methacrylic acid 3-Chloro-2-hydroxypropyl ester.	25421-50	50 ml

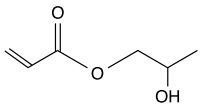
	Catalog #	Size
4-Hydroxybutyl acrylate [2478-10-6] MW 144.17 bp 95 ° C/0.1 mmHg n^{20}_{D} 1.452 d 1.041 g/mL at 25° C MEHQ Colorless to brown liquid $C_7H_{12}O_3$ Increases the hydrophilic properties of polymers when copolymerized into a range of acrylate and methacrylate systems. This monomer has been used polymers for contact lenses and other ophthalmic devices. 	25352-50 25352-100	50 g 100 g
N-Hydroxyethyl acrylamide, 98% [7646-67-5] MW 115.13 bp 130° C / 0.1 mm Hg n^{20}_{D} 1.505 d 1.12 g/mL at 25° C 3,000 ppm MEHQ Colorless to pale yellow liquid $C_5H_9NO_2$ Increases the hydrophilic properties of polymers when copolymerized into a range of acrylate and methacrylate systems. This monomer has been used in hydrogel systems for ocular delivery of ophthalmic drugs. The homopolymer has been used as a novel adsorbed coating for protein separation by capillary electrophoresis.  *For the use of N-hydroxyethyl acrylamide in ophthalmic hydrogels for drug delivery, see: Ribeiro, A., et al. Biomacromolecules, Article ASAP on-line publication February 11, 2011 (http://pubs.acs.org/doi/abs/10.1021/bm101562v)*	25109-50 25109-100	50 g 100 g
2-Hydroxyethyl acrylate [818-61-1] *BHOR6g* MW 116.1 bp 90°/12mm Tg 15° n^{20}_{D} 1.450 350–650 ppm MEHQ TSCA $H_2C{=}CHCO_2CH_2CH_2OH$ Hydrophilic monomer, reactive site for reactions. 	01902-250	250 g
N-(2-Hydroxyethyl) carbazole, min. 97% *U5g* mp 78°–84° C An alcohol which can be esterified with a variety of monomeric acids. 	24596-5	5 g
2-Hydroxyethyl methacrylate [868-77-9] *HO2g* (glycol methacrylate) TSCA $H_2C{=}C(CH_3)CO_2CH_2CH_2OH$ 2-Hydroxyethyl methacrylate (HEMA) is perhaps the most widely studied and used neutral hydrophilic monomer. The monomer is soluble, its homopolymer is water-insoluble but plasticized and swollen in water. This monomer is the basis for many hydrogel products such as soft contact lenses, as well as polymer binders for controlled drug release, absorbants for body fluids and lubricious coatings. As a comonomer with other ester monomers, HEMA can be used to control hydrophobicity or introduce reactive sites. 		
Ophthalmic Grade – Purity % = min. 99; Acid Content % = max 0.05; EGDMA content % = max 0.15; Color = 30 MW 130.1 n^{20}_{D} 1.453 7–13 MEHQ Tg 55°	04675-100 04675-500	100 g 500 g
Low Acid Grade – Purity % = min. 98; Acid Content % = max 0.10; EGDMA content % = max 0.2; Color = 30 MW 116.1 bp 90°/12mm n^{20}_{D} 1.453 180–220 MEHQ Tg 15°	03699-100 03699-500 03699-1	100 g 500 g 1 kg
Technical Grade – Purity % = min. 97; Acid Content % = max 1.5; EGDMA content % = max 0.2; Color = 50 MW 130.1 n^{20}_{D} 130.1 180–220 MEHQ Tg 15°	00227-1	1 kg

	Catalog #	Size
Hydroxypolyethoxy (10) Allyl Ether, 98% [27274-31-3] *H4d*	24899-100	100 g

MW 498 Low viscosity Liquid
Purity: 98% Ethylene oxide, moles: 10 Active content (%): 99 Moisture content (%): 0.2 Hydroxyl number (mg KOH/mg): 115
Difunctional molecule reactive in vinyl polymerization through its allylic group, to impart hydrophilic properties to aqueous solution or emulsion polymers. In particular, solution copolymers of Hydroxypolyethoxy (10) Allyl Ether with Acrylic acid have shown useful properties as dispersants and scale inhibitors in boiler water applications.Hydroxypolyethoxy (10) Allyl Ether is a high purity material, clear, slightly viscous liquid (5 cps at 20°C) which undergoes partial solidification below 10° C to form a viscous paste. Soluble in water as well as alcohols and aromatic solvents.

2-hydroxypropyl acrylate [999-61-1]	25353-50	50 g
	25353-100	100 g

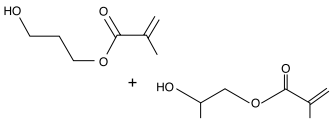
MW 130.14 bp 210° C (1 atm) n^{20}_{D} 1.4432 d 1.049 g/mL at 25° C
MEHQ inhibitor 350–650 ppm Colorless to pale yellow liquid
$C_6H_{10}O_3$
Increases the hydrophilic properties of polymers when copolymerized into a range of acrylate and methacrylate systems. This monomer has been used in hydrogel polymers and in RAFT polymerizations.



Pascual,B.; Castellano, I.; Vazquez, B.; Gurruchaga, M.; Goñi, I. Polymer, 1996, 37(6), 1005-1011.
Vo,C.D.; Rosselgong, J. and Armes, S.P.; Billingham, N.C.Macromolecules, 2007, 40 (20), 7119–7125

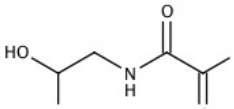
Hydroxypropyl methacrylate, mixture of isomers [27813-02-1] *H4g*	00730-500	500 g
	00730-1	1 kg

MW 144.2 bp 93–95°/9mm n^{20}_{D}1.447 200 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2C_3H_6OH$
Hydrophilic monomer.



N-(2-Hydroxypropyl)methacrylamide [21442-01-3] *U6d*	08242-10	10 g

MW 143.2 mp 67°
$H_3CCH(OH)CH_2NHCOC(CH_3){=}CH_2$
Hydrolytically stable hydrophilic monomer.



I

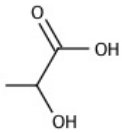
New! N-(Isobutoxymethyl)acrylamide [16669-59-3] *B4d*	25998-50	50 ml

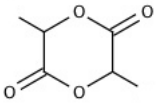
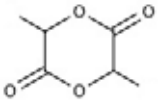
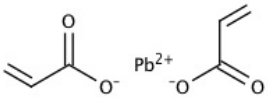
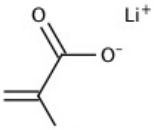
MW 157.21 g/mol bp 108° C (lit.) n^{20}_{D}1.461 d 0.97 g/mL at 25° C (lit.) 200 ppm mono-methyl ether hydroquinone
For thermally crosslinking polymers, especially under acid conditions.

L

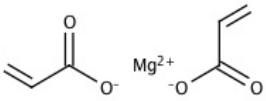
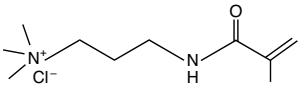
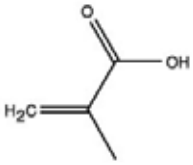
L-Lactic Acid [79-33-4] *H2g*	24618-250	250 g

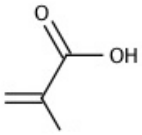
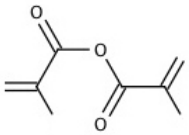
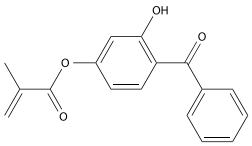
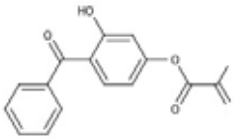
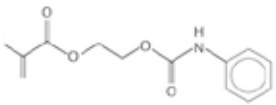
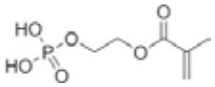
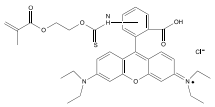
88% Active, remainder is water.



	Catalog #	Size
l-(-)Lactide [4511-42-6] *H3bd* MW 144.1 mp 95–97° TSCA Synthesis of biodegradable homo- and copolymers. 	05749-100	100 g
dl-Lactide [95-96-5] *A2bd* MW 144.1 mp 124–126° TSCA Synthesis of biodegradable homo- and copolymers. 	16640-100	100 g
Lead acrylate [867-47-0] *EHOUV7g* MW 349.3 Imparts x-ray opacity to polymers. 	02968-100	100 g
Lithium methacrylate [13234-23-6] *U6d* MW 92 $H_2C{=}C(CH_3)CO_2Li$ Water-soluble methacrylic acid salt. 	17117-50	50 g

M

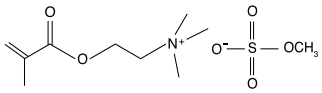
Magnesium acrylate [5698-98-6] *EHOV7d* MW 166.4 Tg 400° TSCA $(H_2C{=}CHCO_2)_2Mg$ Polymerizable metal salt. 	02467-10	10 g
Methacrylamidopropyltrimethylammonium chloride [51410-72-1] *A4g* MW 220.7 ~600 ppm MEHQ TSCA $H_2C{=}C(CH_3)CONH(CH_2)_3N(CH_3)_3Cl$ Quaternary ammonium monomer. 50% soln. in water. 	09657-100	100 g
Methacrylic Acid, 99.9% [79-41-4] *BOW6d* MW 86 200 ppm MEHQ Clear Liquid $H_2C{=}C(CH_3)COOH$ High purity monomer for contact lens applications. High purity carboxylated monomers increase the hydrophilicity in polymers and provide crosslinking sites for divalent ions (e.g. Zn++). Polysciences, Inc. offers both methacrylic acid in high purity (99.9%) and a longer chain analog, Beta-Carboxyethyl acrylate, (99%) 	24897-250	250 g

	Catalog #	Size
Methacrylic acid, min. 99.5% [79-41-4] *BHO6g* MW 86.1 bp 163° Tg 185° n^{20}_{D} 1.431 180–275 ppm MEHQ TSCA $H_2C=C(CH_3)CO_2H$ Carboxylic acid monomer widely used to improve adhesion and introduce reactive sites into polymers. Homopolymers are water-soluble. 	00212-450	450 g
Methacrylic anhydride [760-93-0] *BEKX5g* MW 154.2 bp 80–85°/8mm n^{20}_{D} 1.453 2000 ppm BHT TSCA $[H_2C=C(CH_3)CO]_2O$ Reactive monomer used primarily in preparation of other monomers under mild reaction conditions. Homopolymers are linear and contain cyclic anhydride units, uncrosslinked. 	01517-100	100 ml
4-Methacryloxy-2-hydroxybenzophenone, min 99% [2035-72-5] *U5d* MW 282.3 mp 70–72° λ max (MeOH) 205nm (ε = 3.03 x 104) 275nm (ε = 1.18 x 104) 325nm (ε = 7.23 x 103) UV absorbing monomer, especially for ophthalmic and optic applications. Technical Data Sheet #514 	23350-25	25 g
4-Methacryloxy-2-hydroxybenzophenone, min 94% [2035-72-5] *U5d* MW 282.3 mp 70–72° Min. 94% λ max (MeOH)205nm (ε = 3.03 x 10^4)275nm (ε = 1.18 x 10^4)325nm (ε = 7.23 x 10^3) UV absorbing monomer, especially for ophthalmic and optic applications. Technical Data Sheet #514 	16989-25	25 g
2-methacryloxyethyl phenyl urethane (MAPU) [51727-47-0] *H3bd* MW 249.2 100–250 ppm MEHQ White crystalline powder $C_{13}H_{15}NO_4$ Hydrophilic monomer useful in medical device and ophthalmic applications. 	25507-100 25507-500	100 g 500 g
2-(Methacryloxy)ethyl phosphate [52628-03-2] MW 210.12 d 1.37 g/mL Colorless, viscous liquid $C_6H_{11}O_6P$ Contains 700 – 1000 ppm monomethyl ether hydroquinone and approximately 25% of diester. 	25422-50	50 ml
Methacryloxyethyl thiocarbamoyl rhodamine B *U5ag* (N-[9-(2-carboxy-x-methacryloxy-ethylthiocarbamoylphenyl)-6-diethylamino-3H-xanthen-3-ylidene]-N-ethyl-ethanaminium chloride; PolyFluor® 570) MW 683.24 Fluorescent monomer. Purple crystals. 	23591-100 23591-1	100 mg 1 g

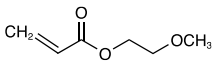
	Catalog #	Size
4-Methacryloxyethyl trimellitic anhydride [70293-55-9] *U5bd* MW 304.2 mp 95° Reactive monomer, especially in dental applications. Used as adhesion promoter.	17285-10	10 g
2-Methacryloxyethyltrimethylammonium chloride [5039-78-1] *H2d* MW 207.7 700 ppm MEHQ $H_2C{=}C(CH_3)CO_2CH_2CH_2N(CH_3)_3Cl$ Quaternary ammonium monomer. 70% soln. in water	16639-100	100 g
2-(2'-Methacryloxy-5'-methylphenyl)benzotriazole [188680-81-1] *U7ad* MW 293.3 mp 57–59° UV absorbing monomer.	21871-25	25 g
3-Methacryloxypropyltrimethoxysilane [2530-85-0] *EH5g* MW 248.1 bp 80°/1mm n_D^{20} 1.431 TSCA $H_2C{=}C(CH_3)CO_2(CH_2)_3Si(OCH_3)_3$ Polymerizable silica-reactive monomer. Provides adhesion to silaceous surfaces.	02476-250	250 g
Methacryloyl chloride, min. 80% [920-46-7] *BCPRS6d* MW 104.5 bp 95–96° n_D^{20} 1.442 200 ppm PTZ TSCA $H_2C{=}C(CH_3)COCl$ Reactive monomer. Can be used to prepare other monomers or reactive polymers. **Special packaging charge, for sale in United States only. Shipping by truck only.*	01518-50 01518-100	50 g 100 g
Methacryloyl fluoride [381-67-9] *BCPRS6d* MW 88.1 bp 56–58° n_D^{20} 1.370 300 ppm PTZ Reactive building block monomer. Also used to prepare other specialty monomers.	17414-25	25 g
O-Methacryloyl Hoechst 33258 *U2d* [(2'-4-methacryloxyphenyl)-5-(4-methyl-1-piperazinyl)-2,5'-bibenzimidazolyl trihydrochloride; PolyFluor® 497) MW 601.9 mp >280° n_D^{20} 1.370 300 ppm PTZ Fluorescent monomer. Off-white crystals	23592-100	100 mg
Methacryloyl-L-Lysine [45158-94-9] *U6g* MW 214 $C_{10}H_{18}N_2O_3$ Can be used as a building block for producing custom made polymers with pendant amine functionality.	24315-5	5 g

	Catalog #	Size
Methacryloylcholine methyl sulfate, 40% soln. in water [6891-44-7] *H5ad*	05810-100	100 g
2-Methoxyethyl acrylate [3121-61-7] *EHW5d*	02487-100	100 g
2-Methoxyethyl methacrylate, min.85% [6976-93-8] *U6d*	02488-100	100 g
Methyl 2-cyanoacrylate [137-05-3] *H5d*	01520-10	10 g
Methyl methacrylate, min 99.5% [80-62-6] *CHO5g*	00834-1	1 liter
	00834-5	5 gal
	00834-3.8	3.8 liters
	00834-4	4 x 1 liter
N-methyl N-vinyl acetamide [3195-78-6] *EH6dg*	22065-25	25 g
N,N'-Methylenebisacrylamide, Chemzymes®; Ultra Pure, Purity >99% [110-26-9] *V4g*	00719-25	25 g
	00719-100	100 g

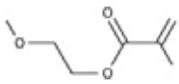
Methacryloylcholine methyl sulfate, 40% soln. in water [6891-44-7] *H5ad*
MW 283.3 800 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CH_2N(CH_3)_3(OSO_3CH_3)$
Quaternary ammonium monomer.



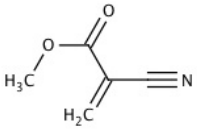
2-Methoxyethyl acrylate [3121-61-7] *EHW5d*
MW 130.2 Tg -50° n^{20}_{D} 1.427 50 ppm MEHQ inhibitor
$H_2C{=}CHCO_2CH_2CH_2OCH_3$
Low Tg, more polar than butyl acrylate. Requires Poison Pack



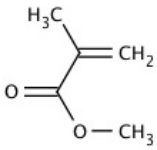
2-Methoxyethyl methacrylate, min.85% [6976-93-8] *U6d*
MW 144.2 bp 66–67°/11mm Tg 16° n^{20}_{D} 1.431 100 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CH_2OCH_3$
More polar than butyl methacrylate with similar Tg.



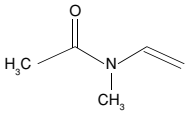
Methyl 2-cyanoacrylate [137-05-3] *H5d*
MW 111.1 bp (2 mm Hg) 51° C TSCA
Used in rapidly setting cements, e.g., Crazy Glue®. Can be copolymerized with conventional monomers by using free radical initiators.



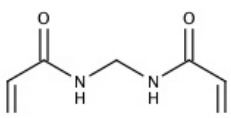
Methyl methacrylate, min 99.5% [80-62-6] *CHO5g*
MW 100.1 bp 99–100° n^{20}_{D} 1.414 25 ppm HQ Tg 105°
$H_2C{=}C(CH_3)CO_2CH_3$
Widely used in preparation of stable, hard, polymers.

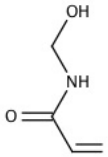
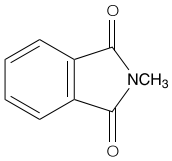
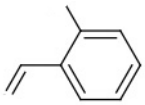
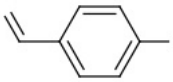
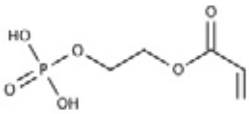
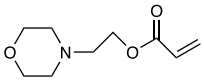
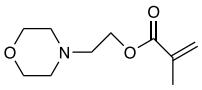


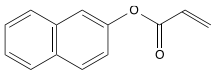
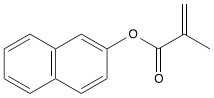
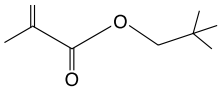
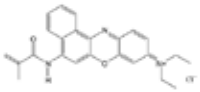
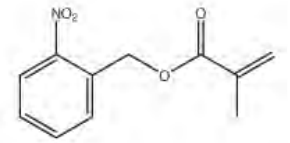
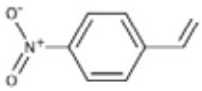
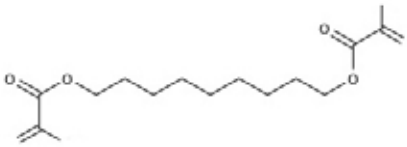
N-methyl N-vinyl acetamide [3195-78-6] *EH6dg*
MW 99.1 bp 70° C, 25 mm Hg Colorless liquid TSCA
C_5H_9NO
Specialty monomer with affinity for water and solvents. Water white liquid has both hydrophobic and hydrophilic character, and is known to undergo polymerization reactions in water or in hydrocarbon solvents with traditional free radical catalysts. Versatility to react with co-monomers such as acrylamide, vinyl acetate and methyl methacrylate allows a wide range of polymeric compositions to be made. Limited shelf life in water, decomposes rapidly under low pH conditions. Available in convenient protective foil packages for laboratory scale, and in bulk quantities for larger projects. Call for custom quotations.

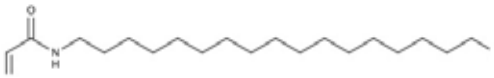
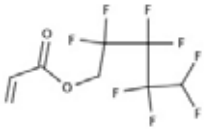
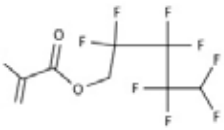
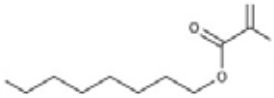
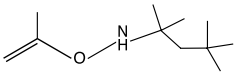
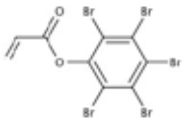


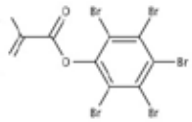
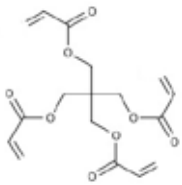
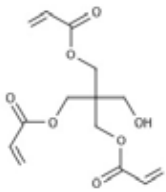
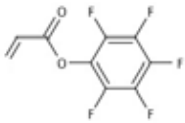
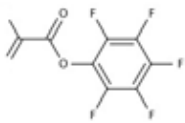
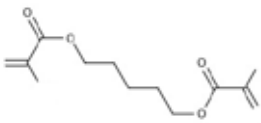
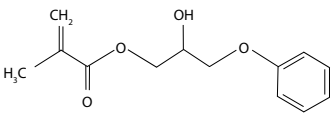
N,N'-Methylenebisacrylamide, Chemzymes®; Ultra Pure, Purity >99% [110-26-9] *V4g*
MW 154.17 mp 300° TSCA
$(H_2C{=}CHCONH)_2CH_2$
High purity crosslinking monomer used for precision PAGE. Also suitable for UV scanning gels. Crosslinking monomer used especially with acrylamide. Purity >99% Conductivity of 2% soln/ <5mmho Technical Data Sheet #479

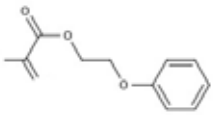
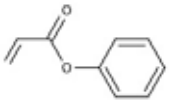
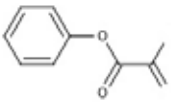
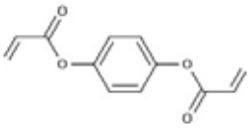
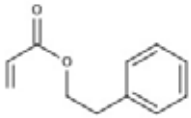
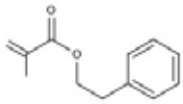
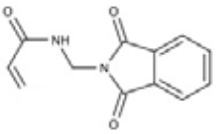


	Catalog #	Size
N-Methylolacrylamide, 48% soln. in water [924-42-5] *HV5g* MW 101.1 TSCA $H_2C{=}CHCONHCH_2OH$ Reactive, acid-curing, monomer, produces post-crosslinking site in polymers. 	02518-250	250 g
N-Methylphthalimide [550-44-7] *H4g* MW 161.1 mp ~137° C Valuable synthon used as a chemical intermediate for synthesis of dyes, drugs, agricultural chemicals, and in coatings and adhesive formulations. 	24281-25	25 g
2-Methylstyrene [611-15-4] *H2d* MW 118.2 bp 171° Tg 120° n^{20}_{D} 1.544 0.1% t-butylcatechol $2\text{-}CH_3C_6H_4CH{=}CH_2$ Substituted styrene monomer. 	04581-5	5 g
4-Methylstyrene [622-97-9] *EH5d* MW 118.2 mp -34° bp 170° Tg 108° n^{20}_{D} 1.542 25 ppm t-butylcatechol TSCA $CH_3C_6H_4CH{=}CH_2$ Substituted styrene monomer. 	04234-100	100 g
Monoacryloxyethyl phosphate [32120-16-4] *B4f* MW 196.1 2000 ppm MEHQ TSCA Water-soluble phosphoric acid ester monomer. Contains Bis(2-Acryloxyethyl) Phosphate. 	22468-10	10 g
2-N-Morpholinoethyl acrylate, 95% [19727-38-9] *HO4g* MW 185.2 bp 67°/0.2mm 100 ppm MEHQ Cationic monomer. 	17977-10 17977-100	10 g 100 g
2-N-Morpholinoethyl methacrylate, 95% [2997-88-8] *EOV7g* MW 199.2 bp 78°/1.7mbar 100 ppm MEHQ Cationic monomer. 	17978-10 17978-100	10 g 100 g

	Catalog #	Size
N		
2-Naphthyl acrylate [52684-34-1] *U6d* MW 268.4 bp 138°/0.4mm Tg 24° Fluorescent monomer. 	06024-1	1 g
2-Naphthyl methacrylate [10475-46-4] *U4d* MW 212.2 mp 62–64° Colorless crystals PolyFluor® 345. Fluorescent monomer. 	23602-100 23602-1	100 mg 1 g
Neopentyl methacrylate [2397-76-4] *EHOV7d* MW 156.3 100 ppm MEHQ $C_2H_5C(CH_3)_2OCOC(CH_3)=CH_2$ Neutral ester monomer. 	06127-10	10 g
Nile Blue Acrylamide [699018-10-5] MW 408 Dark blue crystals $C_{23}H_{22}N_3O_2Cl$ Nile Blue dye itself is a fluorescent dye that is used routinely in histology to impart a blue color to cell nuclei, where it highlights the distinction between neutral lipids (triglycerides, etc.) which are stained pink and fatty acids, which are stained blue. Nile Blue Acrylamide has also been used to covalently link Nile Blue dye into the backbone of polymers for use in various sensor applications.  *1. Chandrasekharan, N.; Ibrahim, S.; Kostov, Y.; Rao, G. Bioautomation 9 (2008) 31-39. 2. Pham, H., et al J. Mater. Chem. 17 (2007) 523-526.*	25395-100	100 mg
o-Nitrobenzyl methacrylate, min. 95% *U7d* 100 ppm HQ Blocked carboxylic acid monomer. 	24360-10	10 g
4-Nitrostyrene [100-13-0] *U6d* MW 149.2 mp 18–19° bp 120°/10mm $4\text{-}NO_2C_6H_4CH=CH_2$ Polar styrene monomer. Can be used to introduce amino groups into polymers. 	02634-5	5 g
1,9-Nonanediol dimethacrylate [65833-30-9] *U7d* MW 296.4 100 ppm HQ $[H_2C=C(CH_3)CO_2(CH_2)_4]_2\text{–}CH_2$ Long-chain crosslinking monomer. 	00801-10	10 g

	Catalog #	Size
O		
N-(n-Octadecyl)acrylamide [1506-54-3] *U2d* MW 323.6 mp 74.5–75.5° $H_3C(CH_2)_{17}NHCOCH{=}CH_2$ Hydrophobic acrylamide monomer. 	04673-10	10 g
1H,1H,5H-Octafluoropentyl acrylate [376-84-1] *B4d* MW 286.1 bp 56°/8mm Tg -35° n^{20}_{D} 1.349 100 ppm MEHQ $H_2C{=}CHCO_2CH_2(CF_2)_3CHF_2$ Low refractive index monomer. Polymer RI: 1.380. 	21044-25	25 g
1H,1H,5H-Octafluoropentyl methacrylate, min. 98% [355-93-1] *EH4g* MW 300.2 bp 178–9° Tg 36° n^{20}_{D} 1.358 100 ppm MEHQ $H_2C{=}C(CH_3)CO_2CH_2(CF_2)_3CHF_2$ Low refractive index monomer. Polymer RI: ~1.39 	21045-25	25 g
n-Octyl methacrylate, 99+% [2157-01-9] *EU6d* MW 198.3 bp 105°/4mm Tg -20° 100 ppm MEHQ $H_3C(CH_2)_7OCOC(CH_3){=}CH_2$ Hydrophobic methacrylate monomer. 	23355-25	25 g
n-Octyl methacrylate [1/9/2157] *EU6d* MW 198.3 bp 105°/4mm Tg -20° n^{20}_{D} 1.437 500 ppm MEHQ $H_3C(CH_2)_7OCOC(CH_3){=}CH_2$ Hydrophobic methacrylate monomer.	02679-25	25 g
N-tert-Octylacrylamide [4223-03-4] *H5d* MW 183.3 mp 63.6° TSCA $H_3C(CH_2)_4C(CH_3)_2NHCOCH{=}CH_2$ Hydrophobic acrylamide derivative. 	03141-25	25 g
P		
Pentabromophenyl acrylate [52660-82-9] *H4d* MW 542.6 mp 150–153° n^{20}_{D} (polymer) ~1.7 $C_6Br_5OCOCH{=}CH_2$ High refractive index monomer. 	06344-10	10 g

	Catalog #	Size
Pentabromophenyl methacrylate [18967-31-2] *H6ad* MW 556.7 mp 132–137° n_D^{20} (polymer) 1.71 $C_6Br_5OCOC(CH_3)=CH_2$ High refractive index monomer. 	04253-5 04253-10	5 g 10 g
Pentaerythritol tetraacrylate [4986-89-4] *HO6g* MW 352.4 mp 18° n_D^{20} 1.487 350 ppm MEHQ TSCA $(H_2C=CHCO_2CH_2)_4C$ Crosslinking monomer. 	01547-100	100 g
Pentaerythritol triacrylate [3524-68-3] *H4d* MW 298.3 mp 15° bp >315.5° Tg 103° n_D^{20} 1.484 300–400 ppm MEHQ TSCA $(H_2C=CHCO_2CH_2)_3CCH_2OH$ Crosslinking monomer. 	04259-100	100 g
Pentafluorophenyl acrylate [71195-85-2] *EJOV7d* MW 238.1 bp 145–149° n_D^{20} D = ~1.433 $C_6F_5OCOCH=CH_2$ Low refractive index monomer. Polymer RI: 1.40 	06349-5	5 g
Pentafluorophenyl methacrylate, 95% [13642-97-2] *H6d* MW 252.1 n_D^{20} 1.40 100 ppm MEHQ $C_6F_5OCOC(CH_3)=CH_2$ Low refractive index monomer. 	06350-5	5 g
1,5-Pentanediol dimethacrylate [13675-34-8] *HU5d* MW 240.3 n_D^{20} 1.455 100 ppm HQ TSCA $[H_2C=C(CH_3)CO_2CH_2CH_2]_2_CH_2$ Crosslinking monomer. 	04260-25	25 g
3-Phenoxy 2 hydroxy propyl methacrylate (PHPM) [16926-87-7] *HO3bd* MW 236.26 2500 ppm MEHQ; 1000 ppm BHT Light yellow to slightly amber liquid $C_{13}H_{16}O_4$ Hydrophilic monomer useful in medical device and ophthalmic applications. Technical Data Sheet #989 	25506-100 25506-500	100 g 500 g

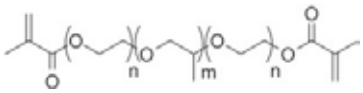
	Catalog #	Size
2-Phenoxyethyl methacrylate [10595-06-9] *U5g* MW 206.2 bp 130–132°/8mm Tg 54° n_D^{20} ~1.513 200 ppm HQ and 200 ppm MEHQ TSCA $H_2C=C(CH_3)CO_2CH_2CH_2OC_6H_5$ UV absorbing monomer. 	02640-100	100 g
Phenyl acrylate, min. 95% [937-41-7] *HU7d* MW 148.2 bp 87–94°/12mm Tg 57° n_D^{20} ~1.58 100 ppm MEHQ TSCA $C_6H_5OCOCH=CH_2$ UV absorbing monomer. 	02642-10	10 g
Phenyl methacrylate , >95% [2177-70-0] *BORVX7d* MW 162.2 bp 115–118°/10mm Tg 110° n_D^{20}1.5120 100 ppm MEHQ TSCA $H_2C=C(CH_3)CO_2C_6H_5$ Moderate UV absorbing monomer. 	02644-10	10 g
1,4-Phenylene diacrylate [6729-79-9] *U5d* MW 218.2 mp 88–89° n_D^{20} 1.531 1,4-$C_6H_4(OCOCH=CH_2)_2$ Rigid aromatic crosslinking monomer. 	06389-10	10 g
2-Phenylethyl acrylate, min. 92% [3530-36-7] *HO5d* MW 176.2 bp 104–106°/5mm Tg -3° n_D^{20} ~1.509 100 ppm PTZ TSCA $C_6H_5CH_2CH_2OCOCH=CH_2$ Moderate UV absorbing monomer useful for ophthalmic applications. 	02834-100	100 g
2-Phenylethyl methacrylate, min. 92% [3638-12-3] *H7d* MW 190.3 bp 119–120°/11mm Tg 26° n_D^{20} = 1.55 100 ppm MEHQ TSCA $C_6H_5CH_2CH_2OCOC(CH_3)=CH_2$ Moderate UV absorbing monomer useful for ophthalmic applications. 	02911-100	100 g
N-(Phthalimidomethyl)acrylamide [80500-44-3] *DU7g* MW 230.2 mp 190° Used as a photoresist and other photosensitive bodies. 	19390-25	25 g

					Catalog #	Size
Poly(ethylene glycol) (n) diacrylate [26570-48-9] *HO5g* TSCA $H_2C{=}CHCO(OCH_2CH_2)_nO_2CCH{=}CH_2$ Long-chain, hydrophilic, crosslinking monomers. (n) value is MW of PEG unit.						
MW 200	n^{20}_D 1.464	750 ppm MEHQ	d. 1.122	Viscosity 25 cps @ 25°	00669-100	100 g
MW 200	n^{20}_D 1.464	750 ppm MEHQ	d 1.122	Viscosity 25 cps @ 25°	00669-250	250 g
MW 400	n^{20}_D 1.4655	500 ppm MEHQ	d 1.117	Viscosity 57 cps @ 25°	01871-250	250 g
MW 1,000	mp 35 - 37° C	~1500 ppm MEHQ			25485-1	1 g
					25485-5	5 g
MW 4,000	mp 56 - 60°				15246-1	1 g
Poly(ethylene glycol) (n) dimethacrylate [25852-47-5] *H5g* TSCA $CH_2C{=}CCH_3CO(OCH_2CH_2)_nO_2CC(CH_3){=}CH_2$ Long-chain hydrophilic, crosslinking monomers. (n) value is MW of PEG unit.						
MW 200	n^{20}_D 1.460	75 ppm HQ	d 1.08	Viscosity 15 cps @ 25° C	00096-100	100 g
MW 400	n^{20}_D 1.465	245 ppm MEHQ	d 1.117	Viscosity 85 cps @ 25° C	15179-100	100 g
MW 600	n^{20}_D 1.466	1,000 ppm MEHQ	d 1.101	Viscosity 7 cps @ 25° C	02364-100	100 g
MW 1,000	n^{20}_D 1.460	90 ppm MEHQ & 250 ppm BHT	d 1.10	Viscosity 76 cps @ 40° C	15178-100	100 g
MW 8,000	mp 54-57° C	white solid			25428-2	2 g
					25428-10	10 g
MW Mn ~20K	bp >250° C	white solid			25406-5	5 g
					25406-25	25 g
Poly(ethylene glycol) (n) monomethacrylate [25736-86-1] *H5ad* TSCA $H_2C{=}C(CH_3)CO(OCH_2CH_2)_nOH$ Long-chain hydrophilic macromonomers. Used to introduce hydrophilic sites into polymers, to stabilize emulsion polymers, and to prepare comb polymers. (n) value is MW of PEG unit.						
MW 200	n^{20}_D 1.105	up to 700 ppm MEHQ inhibitor			16712-100	100 g
MW 400	n^{20}_D 1.114	800-1,000 ppm MEHQ inhibitor			16713-100	100 g
MW 2,000	mp 48 - 51°				25427-1	1 g
					25427-5	5 g
Poly(ethylene glycol) (n) monomethyl ether monomethacrylate [26915-72-0] *BHJO6d* TSCA $H_2C{=}C(CH_3)CO_2(CH_2CH_2O)_nCH_3$ Hydrophilic monomer used to introduce hydrophilic sites into polymers, to stabilize polymer emulsions and synthesis of comb polymers. (n) value is MW of PEG unit.						
MW 200	n^{25}_D 1.449	100 ppm MEHQ and 300 ppm BHT inhibitor			16664-100	100 g
					16664-500	500 g
MW 400	n^{25}_D 1.457	Tg -62°	100 ppm MEHQ and 200 ppm BHT inhibitor		16665-100	100 g
					16665-500	500 g
MW 1,000	n^{25}_D 1.46	Tg 40°	100 ppm MEHQ and 300 ppm BHT inhibitor		16666-100	100 g
					16666-500	500 g

	Catalog #	Size
MW 1,900 mp 51-53°C	25425-1	1 g
	25425-5	5 g
MW of PEG Block 5,000 mp 58-60°C	25426-1	1 g
	25426-5	5 g

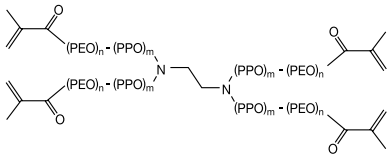
PEO(5800)-b-PPO(3000)-b-PEO(5800) dimethacrylate *U4abd* . . . . . 25430-1 1 g; 25430-5 5 g

MW 14,600 mp 56° C White solid
Long-chain hydrophilic, crosslinking macromonomer. Triblock copolymer with methacrylate endgroups contains blocks of PEO and PPO to provide a balance of hydrophilic and hydrophobic properties.



[PEO(10700)-b-PPO(4500)]4-ethylenediamine tetramethacrylate *U4abd* . . . . . 25429-1 1 g; 25429-5 5 g

MW 60,800 mp 45–47° C White solid
Long-chain branched hydrophilic, crosslinking macromonomer. Block copolymer with methacrylate endgroups on each of the 4 arms contains blocks of PEO and PPO to provide a balance of hydrophilic and hydrophobic properties.

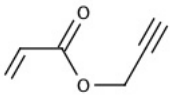


Poly(propylene glycol) dimethacrylate [25852-49-7] *HO7d* . . . . . 04380-250 250 g

MW of PEG Block = 400 bp >300° n^{20}_{D} 1.452 d 1.01 100 ppm MEHQ & 100 ppm BHT TSCA
$H_2C{=}C(CH_3)CO(OC_3H_6)_nO_2CC(CH_3){=}CH_2$
Water-insoluble crosslinking monomer. (n) value is MW of PEG unit.

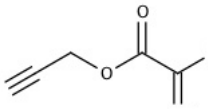
Propargyl acrylate [10477-47-1] *CVWX6d* . . . . . 02964-25 25 g

MW 110.1 bp 138° n^{20}_{D} 1.446 TSCA
Acetylenic monomer. Polymer can be derivatized and possible oxidatively crosslinked.



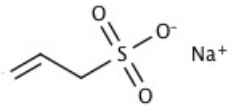
Propargyl methacrylate [13861-22-8] *U4ad* . . . . . 02965-25 25 g

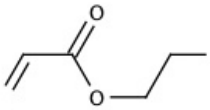
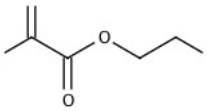
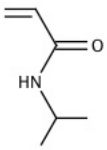
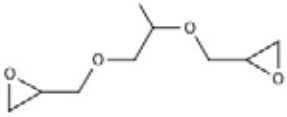
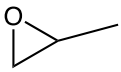
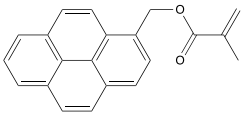
MW 124.1 bp 149–151° n^{20}_{D} 1.448 TSCA
$HCCCH_2OCOC(CH_3){=}CH_2$
Acetylenic monomer. Polymer can be derivatized and possible oxidatively crosslinked.



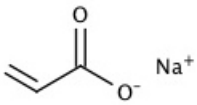
2-Propene-1-sulfonic acid, sodium salt, 35% soln. in water [2495-39-8] *HJU2g* . . . . . 00064-10 10 g

MW 144.1 TSCA
$H_2C\text{-}CHCH_2SO_3Na$
Water-soluble anionic monomer. Used to introduce polar, ionic sites into polymers.



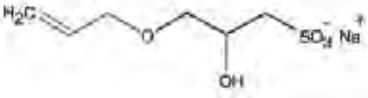
	Catalog #	Size
n-Propyl acrylate [925-60-0] *EHJ4d* MW 114.2 bp 43–44°/40mm Tg -37° n_D^{20} 1.413 500 ppm MEHQ TSCA Neutral ester monomer. 	03132-25	25 g
n-Propyl methacrylate [2210-28-8] *EU5d* MW 128.2 bp 140–141° Tg 35° n_D^{20} 1.419 100 ppm MEHQ TSCA $H_3CCH_2CH_2OCOC(CH_3)=CH_2$ Neutral ester monomer. 	03174-100	100 g
N-iso-Propylacrylamide [2210-25-5] *H5g* MW 113.2 mp 64–65° Tg 85° TSCA $H_2C=CHCONHCH(CH_3)_2$ Water-soluble monomers. Polymers are water-soluble at room temperature but are insoluble at slightly higher temperatures. 	02455-25 02455-100	25 g 100 g
Propylene glycol diglycidyl ether [16096-30-3] *H4g* Crosslinker for amine-, hydroxyl-, and carboxyl-functional polymers. WPE ~150 	24044-100	100 g
Propylene Oxide, EM Grade [75-56-9] *BCHV6g* MW 58.08 bp 34° n_D^{20} 1.366 d 0.83 TSCA Solvent used in the last stage of dehydration of tissue for epoxy embedding. Requires Posion Pack 	00236-1	1 pint
1-Pyrenylmethyl methacrylate [86112-79-0] *U5g* MW 300.3 mp 99–101° Pale yellow crystals Fluorescent monomer. PolyFluor® 394 **Ex. max**: 339nm **Em. Max**: 394nm 	23588-100 23588-1	100 mg 1 g

S

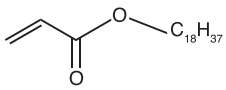
Sodium acrylate [7446-81-3] *H5g* MW 94.1 Tg 230° TSCA $H_2C=CHCO_2Na$ Polymerizable acid salt. 	01207-50	50 g

	Catalog #	Size
Sodium 1-Allyloxy-2 hydroxypropyl Sulfonate [52556-42-0] *H4d*	24898-100	100 g
Stearyl acrylate [4813-57-4] *U5d*	02636-100	100 g
Stearyl methacrylate [32360-05-7] *HO4d*	02637-100	100 g
Styrene [100-42-5] *CHM6g*	00660-500	500 g
2-Sulfoethyl methacrylate, >90% [10595-80-9] *B4d*	02597-50	50 g
3-Sulfopropyl acrylate, potassium salt [31098-20-1] *H2g*	17209-100	100 g
3-Sulfopropyl methacrylate, potassium salt, 98% [31098-21-1] *H5g*	17210-100	100 g
3-Sulfopropyldimethyl-3-methacrylamidopropylammonium, inner salt [5205-95-8] *U4g*	16570-5	5 g

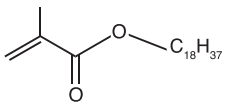
Sodium 1-Allyloxy-2 hydroxypropyl Sulfonate [52556-42-0] *H4d*
MW 218
Water (%): 60 Active Polymer (% in aq. sol.): 40 pH (10% in water): 7.5
Sodium salt of the allyl ether sulfonate. It readily undergoes vinyl polymerization reactions in aqueous or emulsion systems and provides a bound source of anionically charged sulfonate groups in a polymer backbone.



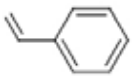
Stearyl acrylate [4813-57-4] *U5d*
MW 324.6 mp 28° bp 160°/3mm Tg 35° 75 ppm MEHQ TSCA
$H_2C{=}CHCO_2(CH_2)_{17}CH_3$
Long-chain acrylate ester. Polymers are hydrocarbon-soluble.
Mixture of C_{16} and C_{18} Total esters >90%



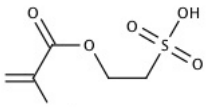
Stearyl methacrylate [32360-05-7] *HO4d*
MW 338.6 bp 181°/15mm Tg 38° n^{20}_D 1.452 100 ppm HQ TSCA
$H_2C{=}C(CH_3)CO_2(CH_2)_{17}CH_3$
Hydrophobic methacrylate ester. Polymers are hydrocarbon-soluble.
Mixture of C_{16} and C_{18} total esters, >90%.



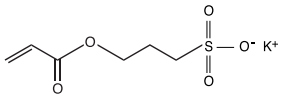
Styrene [100-42-5] *CHM6g*
MW 104.5 bp 33–35°/8mm Tg 100° n^{20}_D 1.547 100–200 ppm MEHQ TSCA
Widely used monomer which forms hard, hydrophobic polymers.



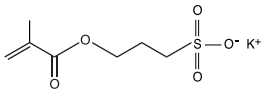
2-Sulfoethyl methacrylate, >90% [10595-80-9] *B4d*
MW 194.1 n^{20}_D 1.477 d 1.3245 3000 ppm MEHQ TSCA
Water-soluble monomer. Used to introduce polar sites into polymer chains, confer shear stability to aqueous polymer dispersions.



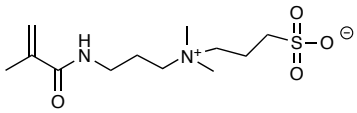
3-Sulfopropyl acrylate, potassium salt [31098-20-1] *H2g*
MW 232.3 mp 302° (dec.)
$H_2C{=}CHCO_2(CH_2)_3SO_3K$
Water-soluble monomer. Used to introduce polar sites into polymer chains, confer shear stability to aqueous polymer dispersions.

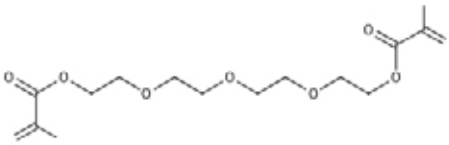
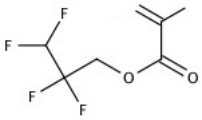
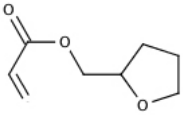
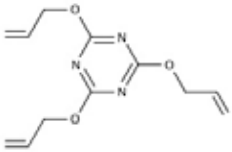
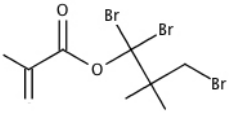
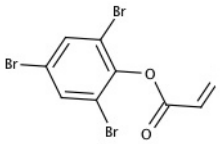
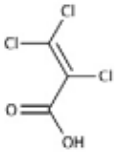


3-Sulfopropyl methacrylate, potassium salt, 98% [31098-21-1] *H5g*
MW 246.3 mp 295° (dec.)
$H_2C{=}C(CH_3)CO_2(CH_2)_3SO_3K$
Water-soluble monomer. Used to introduce polar sites into polymer chains, confer shear stability to aqueous polymer dispersions.



3-Sulfopropyldimethyl-3-methacrylamidopropylammonium, inner salt [5205-95-8] *U4g*
(Dimethyl[3-methacrylamidopropyl]-3-sulfopropylammonium, inner salt) MW 292.4 mp 199 – 200°
$H_2C{=}C(CH_3)CONHCH_2CH_2CH_2N(CH_3)_2(CH_2)_3SO_3$
Polar water-soluble monomer. Zwitterionic detergent and crosslinker.



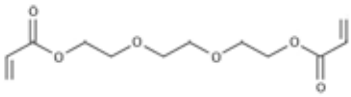
	Catalog #	Size
T		
Tetraethylene glycol dimethacrylate [109-17-1] *HJO4d* . . . . . MW 330.3 bp 220° n_D^{20} 1.463 75 ppm HQ TSCA Crosslinking monomer. 	02654-50	50 g
1H,1H,3H-Tetrafluoropropyl methacrylate [45102-52-1] *EHOV7d* . . . . . MW 200.1 bp 69–72°/51mm n_D^{20} 1.373 100 ppm MEHQ $H_2C=C(CH_3)CO_2CH_2CF_2CHF_2$ Low refractive index monomer. 	07577-25	25 g
Tetrahydrofurfuryl acrylate [2399-48-6] *H5d* . . . . . MW 156.2 bp 75.5°/2mm Tg -12° n_D^{20} 1.460 900 ppm MEHQ and 100 ppm HQ TSCA Cyclic ether derivative. 	02907-250	250 g
Triallyl cyanurate [101-37-1] *H5bg* . . . . . MW 249.3 mp >110° bp 162°/2mm n_D^{20} 1.505 100 ppm HQ TSCA Crosslinking monomer. 	01236-100 01236-500	100 g 500 g
Tribromoneopentyl methacrylate *U7d* . . . . . MW 392.9 Halogenated ester monomer for preparing flame-resistant polymers. 	03057-10	10 g
2,4,6-Tribromophenyl acrylate [3741-77-3] *U5d* . . . . . MW 384.9 mp 77–78° TSCA For high refractive index (n ~1.60) polymers. 	03330-10	10 g
Trichloroacrylic acid [18901-22-9] *B7g* . . . . . MW 175.4 mp 72° Halogenated acrylic acid derivative. 	02686-10	10 g

	Catalog #	Size
Tricyclodecane dimethanol diacrylate [42594-17-2]	25110-50	50 g
	25110-100	100 g

MW 304.38 n_D^{20} 1.506 d 1.10 g/mL at 25° C Clear liquid
$C_{18}H_{24}O_4$
High refractive index monomer which exhibits low volume shrinkage in polymerization. Used in optical lens and optical fiber applications due to its high refractive index. Has also been used in dental composite applications for its low volume shrinkage.

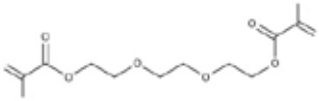
Triethylene glycol diacrylate [1680-21-3] *BHO4g*	02655-250	250 g

MW 258.3 mp 125°/2mm Tg 70° n_D^{20} 1.461 1170 ppm HQ TSCA
Crosslinking monomer. Used in UV curing coatings.



Triethylene glycol dimethacrylate [109-16-0] *A2d*	24034-100	100 g
	01319-250	250 g

MW 286.2 bp 162°/1.2mm 80 ppm HQ TSCA
$[H_2C{=}C(CH_3)CO_2CH_2CH_2OCH_2\text{-}]_2$
Crosslinking monomer. Used in UV curing coatings, soft contact lenses. *(Cat. #01319)* = min. 88%, *(Cat. #24034)* = min. 95%

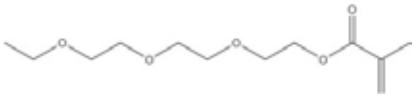


Triethylene glycol divinyl ether [765-12-8] *U4g*	19560-100	100 g

MW 202.3 bp 123°/18mm n_D^{20} 1.453 TSCA
$H_2C{=}CH(OCH_2CH_2)_3OCH{=}CH_2$
Crosslinking monomer. Used in UV curing coatings.

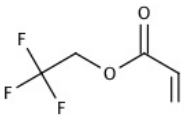
Triethylene glycol monomethyl ether monomethacrylate [39670-09-2] *A2d*	18556-500	500 g

MW 246.3 bp >100°/1mm 100 ppm MEHQ TSCA
Hydrophilic monomer. See poly(ethylene glycol) monomethyl ether monomethacrylate ester listings for longer chain length analogs.



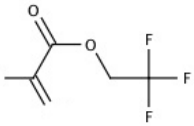
2,2,2-Trifluoroethyl acrylate [407-47-6] *CH6d*	01718-25	25 g

MW 154.1 bp 91–92°/749mm Tg -10° n_D^{20} 1.350 100 ppm MEHQ TSCA
$H_2C{=}CHCO_2CH_2CF_3$
For reduced refractive index (1.407) polymers.



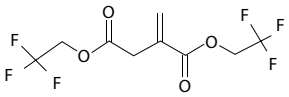
2,2,2-Trifluoroethyl methacrylate [352-87-4] *CH4f*	02622-25	25 g

MW 168.1 bp 30°/40mm Tg 80° n_D^{20} 1.361 100 ppm MEHQ TSCA
$H_2C{=}C(CH_3)CO_2CH_2CF_3$
For reduced refractive index (1.437) polymers.



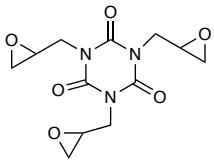
	Catalog #	Size
Bis-(2,2,2-Trifluoroethyl) Itaconate [104534-96-5] *HU4d*	24972-25	25 g

Bis-(Trifluoroethyl) Itaconate MW 294.15 bp 772–5° @ 80mm n_D^{20} 1.333 d 1.47 grams/mL Clear, colorless liquidTSCA
$C_9H_8F_6O_4$
Fluoromonomer useful in producing polymers for the formulation of plastics with high performance and unique strength and durability. Fluoropolymers created from fluoromonomers are high value added materials with unique properties including chemical and heat resistance and the ability to withstand corrosion. Products made from fluoropolymers include surfactants, optical fibers, biomaterials, coatings for nonstick bakeware and membranes for fuel cells.



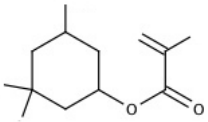
Triglycidyl isocyanurate [2451-62-9] *HO6g*	16173-50	50 g

MW 297.3 mp 95° TSCA
Effective crosslinker for hydroxyl; amine; and carboxylic acid-functional polymers.



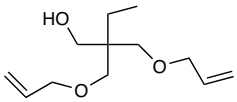
3,3,5-Trimethylcyclohexyl methacrylate [7779-31-9] *H4d*	02660-25	25 g
	02660-500	500 g

MW 210.1 bp 80–82°/2mm n_D^{20} 1.456 200 ppm MEHQ TSCA
$H_2C=C(CH_3)CO_2C_6H_8(CH_3)_3$
Ester monomer having a bulky alkyl group.



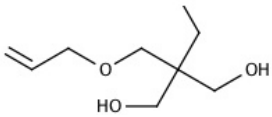
1,1,1-Trimethylolpropane diallyl ether [682-09-7] *H7g*	05500-50	50 g

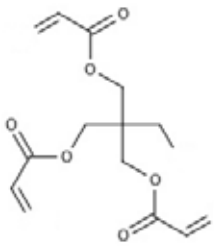
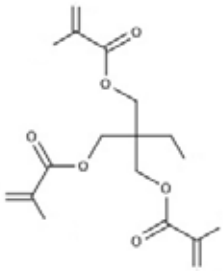
MW 214.3 bp 145°/25mm n_D^{20} 1.458 TSCA
$C_2H_5C(CH_2OCH_2CH=CH_2)_2CH_2OH$
Crosslinking monomer.



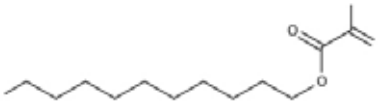
1,1,1-Trimethylolpropane monoallyl ether [682-11-1] *U7g*	15914-50	50 g

MW 174.4 mp <-10° bp 160°/25mm n_D^{20} 1.467 TSCA
$H_2C=CHCH_2OCH_2C(C_2H_5)(CH_2OH)_2$
Hydrophilic monomer.

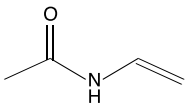
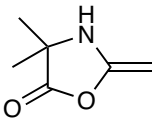


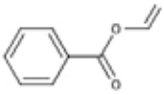
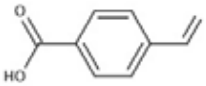
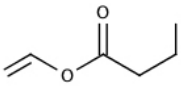
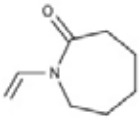
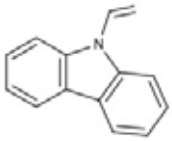
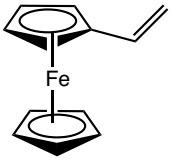
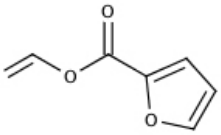
	Catalog #	Size
1,1,1-Trimethylolpropane triacrylate [15625-89-5] *H4g* MW 296.3 bp 316° n_D^{20} 1.474 100 ppm MEHQ and <20 ppm HQ TSCA $(H_2C{=}CHCO_2CH_2)_3CC_2H_5$ Crosslinking monomer. 	02658-250	250 g
1,1,1-Trimethylolpropane trimethacrylate [3290-92-4] *HO2d* MW 338.4 bp 185°/5mm n_D^{20} 1.472 65 ppm HQ TSCA $[H_2C{=}C(CH_3)CO_2CH_2]_3CC_2H_5$ Crosslinking monomer. 	02659-250	250 g

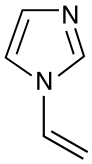
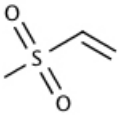
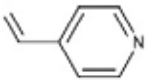
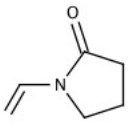
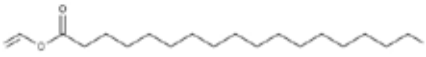
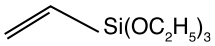
U

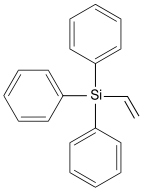
Undecyl methacrylate [16493-35-9] *HO6f* MW 240.4 TSCA Long-chain alkyl methacrylate ester. High boiling liquid. 	02544-25	25 g

V

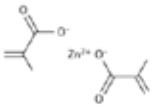
N-vinyl acetamide (NVA) [5202-78-8] *HK4g* MW 85.1 mp 54° C bp 96° C, (10 mm Hg) White solid TSCA Polymers produced from NVA offer a balance of hydrophilic and hydrophobic properties and find applications ranging from adhesives and thickeners to formulating aids to binders for inorganics. Specific Gravity: 1.05 @ 20° C 	24806-50	50 g
Vinyl azlactone [29513-26-6] *EHU6f* MW 139.2 mp 6° C bp 52° C at 9mm Hg n_D^{20} 1.4575 Reactive heterocyclic monomer. Hydrolyzed to N-acryloyl-2-methylalanine. 	21329-5	5 g

	Catalog #	Size
Vinyl benzoate [769-78-8] *HJ7d* MW 148.2 bp 72-76°/8mm n_D^{20} 1.529 20 ppm HQ Tg 75° $C_6H_5CO_2CH{=}CH_2$ Aromatic vinyl ester. 	02664-50 02664-100	50 g 100 g
4-Vinylbenzoic acid [1075-49-6] *HVWX6g* MW 148.2 mp 143 - 144° $H_2C{=}CHC_6H_4CO_2H$ Carboxylic acid styrene monomer. 	04485-5	5 g
Vinyl butyrate [123-20-6] *JU7dk* MW 114.1 bp 115 – 117° Tg -5° n_D^{20} 1.411 $H_2C{=}CHOCOCH_2CH_2CH_3$ Polymer has lower Tg than poly(vinyl acetate) and is more hydrophobic. 	02835-10	10 g
N-Vinylcaprolactam, min. 98% [2235-00-9] *HU4d* MW 139.2 mp 34.5 – 36.0° TSCA Capable of ring-opening polymerization as well as free radical polymerization. 	16818-10	10 g
N-Vinylcarbazole [1484-13-5] *HMO7g* MW 193.3 mp 65 – 67° n_D^{20} 1.6830 Polymers are photoconductive, especially in the form of complexes. Technical Data Sheet #263 	02429-25	25 g
Vinylferrocene [1271-51-8] *U5g* MW 212.1 mp 50 – 53° bp 80°/0.2mm Tg 187° Organometallic monomer. 	04503-1	1 g
Vinyl 2-furoate [1917-10-8] *U5d* MW 138.1 bp 182°/10mm Vinyl and Ethenyl Monomer. 	02829-10	10 g

	Catalog #	Size
1-Vinylimidazole [1072-63-5] *BE6g* MW 94.1 bp 78–79°/13mm n_D^{20} 1.530 TSCA Cationic monomer. 	01726-100	100 g
Vinyl methyl sulfone [3680-02-2] *HJWX7g* MW 106.4 bp 115°/19mm 1.463 Requires Poison Pack 0.02% p-t-butylphenol $H_2C{=}CHSO_2CH_3$ Water-soluble vinyl monomer. 	17206-5	5 g
Vinyl octadecyl ether [930-02-9] *U6g* MW 296.5 mp 27° bp 187°/5mm n_D^{20} 1.444 TSCA $CH_3(CH_2)_{17}OCH{=}CH_2$ Long-chain, hydrophobic vinyl ether.	01728-100	100 g
4-Vinylpyridine [100-43-6] *BEVWX7f* MW 105.1 bp 62–65°/15mm n_D^{20} 1.550 100 ppm HQ Tg 142° TSCA Aromatic amine monomer. 	02668-100	100 g
N-Vinyl-2-pyrrolidone [88-12-0] *HM6d* (1-vinyl-2-pyrrolidinone) MW 111.1 mp 13–14° bp 90°/10mm n_D^{20} 1.512 Tg 175° Neutral hydrophilic monomer. Polymers are water-soluble. 95.5% redistilled, optical grade. APHA color Soluble in water. 	04000-250	250 g
Vinyl stearate, min. 95% [111-63-7] *U6g* MW 310.5 mp 34–36° 20 ppm MEHQ $CH_3(CH_2)_{16}CO_2CH{=}CH_2$ Hydrophobic long-chain vinyl ester. 	01784-100	100 g
Vinyltriethoxysilane [78-08-0] *BE6bg* MW 190.3 bp 157–159° n_D^{20} 1.398 TSCA $H_2C{=}CHSi(OC_2H_5)_3$ For introducing sites into polymers which adhere to silaceous surfaces. Moisture sensitive. 	04537-50	50 g

	Catalog #	Size
Vinyltriphenylsilane [18666-68-7] *H7g* . . . . . MW 286.5 mp 68-70° TSCA $(C_6H_5)_3SiCH{=}CH_2$ Bulky silane monomer. 	21543-10	10 g

Z

Zinc (di)methacrylate [13189-00-9] *HO4bd* . . . . . MW 237.6 mp >250 TSCA $[H_2C{=}C(CH_3)CO_2]_2Zn$ Can be used to introduce ionic crosslinks into polymers. 	03011-100	100 g

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Polysciences stocks a wide portfolio of polymers. This variety provides the formulation scientist a useful set of tools to design compositions with markedly different performance. These polymers can also be used by the synthetic scientist as platforms on which to build yet more complex polymer systems.

Polymer Selection Tables

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Acid Functional Polymers & Salts

Acidic groups are often used to convey solubility to polymers in aqueous media. These versatile moieties can be converted to a wide range of alternative functional groups. Acid groups can be utilized as catalysts for chemical reactions. Additionally they are employed in polymers as the functional group which enables improved adhesion to a variety of substrates through hydrogen bonding or metal chelation.

Carboxylic Acids

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(acrylic acid)	~2,000	63% AQ		06513-250	250 g	281
	~5,000	50% AQ		06519-250	250 g	281
	~50,000	25% AQ		00627-250	250 g	281
	~345,000	25% AQ		03326-250	250 g	281
	~450,000	powder		03312-100	100 g	281
	~1,000,000	powder		06500-100	100 g	281
	~4,000,000	powder		06501-100	100 g	281
Poly(acrylic acid) ammonium salt	250,000	powder		03311-25	25 g	281
Poly(acrylic acid) sodium salt	~2,000	powder	water-soluble anionic polymer, low molecular weights used as pigment dispersants, high MW's used as flocculants	06568-250	250 g	281
	~3,000	40% AQ		18608-250	250 g	281
	~5,000	40% AQ		18609-250	250 g	281
	~6,000	powder		06567-250	250 g	281
	~60,000	35% AQ		18611-250	250 g	281
	~225,000	20% AQ		18613-250	250 g	281
Poly(butadiene/maleic acid) 1:1 (molar)	10K–15K	42% AQ	anionic polymer capable of anhydride or backbone unsaturation reaction	07787-500	500 g	283
Poly(n-butyl acrylate/acrylic acid) [50:50]		20% latex / alcohol		19911-10	10 g	284
Poly(ethyl acrylate/acrylic acid), [50:50]		20% in EtOH		19914-10	10 g	287
		powder		21056-5	5 g	287
Poly(ethylene/acrylic acid) [92:8]				06517-100	100 g	287
Poly(ethylene/maleic anhydride) 1:1 (molar)	400,000	powder	reacts with alcohols or amines	02308-50	50 g	293
Poly(maleic acid), 50% soln. in water	800–1,200	50% AQ		09732-10	10 g	300
Poly(methacrylic acid)	100,000	powder	water soluble polymer	00578-10	10 g	300
Poly(methacrylic acid) ammonium salt, 30% soln. in water	15,000	30% AQ	forms insoluble salts with polyamines	21169-25	25 g	300
Poly(methacrylic acid) sodium salt, 30 % soln. in water	15,000	30% AQ	forms insoluble salts with polyamines	21170-25	25 g	300
Poly(methyl methacrylate/ methacrylic acid)	100,000	powder		08207-50	50 g	301
	500,000	powder		19629-100	100 g	301
	1,200,000	powder		08208-100	100 g	301
		powder		08221-100	100 g	301
Poly(styrenesulfonic acid/ maleic acid), sodium salt	15,000	25% AQ	can be used as a pigment dispersant	11795-25	25 g	304
	20,000	powder	can be used as a pigment dispersant	18407-25	25 g	304
Poly(vinyl chloride/vinyl acetate/ maleic acid) [86:13:1]				18356-500	500 g	307

Phosphoric Acids

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(vinyl phosphoric acid), sodium salt	>200,000	powder	straight chain; 5% phosphorus	04391-5	5 g	308

Sulfonic Acids

	Mol. Weight	Form	Comments			
Poly(styrenesulfonic acid)	70,000	30% AQ	ionic polymer in acid form	08770-250	250 g	304
Poly(styrenesulfonic acid), sodium salt	75,000	powder	ionic polymer in salt form	08772-25	25 g	304
	1,000,000	powder		08773-25	25 g	304

Acrylate & Methacrylate Polymers

	Mol. Weight	Form	Comments			
Poly(benzyl methacrylate)				06562-10	10 g	282
Poly(iso-butyl acrylate)		20% soln. in toluene		07034-250	250 g	283
Poly(n-butyl acrylate)	10,000	20% soln. in toluene		03561-250	250 g	283
Poly(tert-butyl acrylate)		35% soln. in toluene		18240-25	25 g	284
Poly(iso-butyl methacrylate) fine powder, [η] = 0.60	200,000			02452-500	500 g	284
Poly(n-decyl acrylate)	130,000	20% soln. in toluene		07042-50	50 g	286
Poly(ethyl acrylate)	70,000			17342-2	2 g	287
Poly(glycidyl methacrylate), 10% soln. in MEK	25,000	10% soln. in MEK	reacts with carboxyls, hydroxyls or amines	06524-5	5 g	296
Poly(2-hydroxyethyl methacrylate/ methacrylic acid) [90:10]			water soluble in presence of alkali	08725-10	10 g	297
Poly(2-hydroxypropyl methacrylate)				09690-10	10 g	297
Poly(lauryl acrylate), 20% soln. in toluene		20% soln. in toluene		09697-25	25 g	299
Poly(lead methacrylate 2-ethylhexanoate/ methyl methacrylate) [83:17] (by wt.)				16399-25	25 g	299
Poly(methyl methacrylate)	25,000			04554-500	500 g	301
	75,000			04553-500	500 g	301
	100,000			17913-500	500 g	301
	500,000			04552-500	500 g	301
Poly(methyl methacrylate/ n-butyl methacrylate)				01922-500	500 g	301
Poly(octadecyl methacrylate)	170,000	~40% soln. in toluene		04321-100	100 g	302
Poly(iso-propyl methacrylate)				07052-10	10 g	303
Poly(tert-butyl methacrylate)				07037-25	25 g	304

Amides

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Polyacrylamide	10,000	50% AQ	nonionic water soluble polymer; high molecular weight polymers find application as flocculants	22581-250	250 g	280
	600K–1M	10% AQ		19901-250	250 g	280
Polyacrylamide	5,000,000	1% AQ		21485-250	250 g	280
	5M- 6M	powder		02806-250	250 g	280
	18,000,000	powder		18522-100	100 g	280
Poly(acrylamide/acrylic acid), Na Salt	200,000	powder		04652-250	250 g	280
	>10,000,000	powder		18545-250	250 g	280
	200,000	powder	anionic acrylamide polymer	02220-250	250 g	280
Polycaprolactam	18,000	powder	widely used in fibers	18180-250	250 g	284
	35,000	pellets		18179-250	250 g	284
Polyetherimide	30,000	powder	high softening point resin	16845-100	100 g	287
Poly(2-ethyl-2-oxazoline)	5,000	powder	neutral water soluble polymer, can be hydrolyzed to linear polyethylenimine	24066-50	50 g	295
	50,000	powder		17808-100	100 g	295
	200,000	powder		24882-100	100 g	295
	500,000	powder		17810-100	100 g	295
Poly(hexamethyleneadipamide)		powder	used in fibers. mp 265–270° C	06557-500	500 g	296
Poly(hexamethylenesebacamide)				06558-500	500 g	296
Polymethacrylamide		powder	water soluble polyamide	16144-10	10 g	300
Poly(N-iso-propylacrylamide)	40,000	powder	soluble at RT, insoluble above 40° C	21458-10	10 g	302
Starch, poly(acrylamide/acrylic acid) graft, acid sodium salt			water abosrbing, water holding resin	08215-100	100 g	309

Amine Functional Polymers

	Mol. Weight	Form	Comments			
Poly(4-vinylpyridine / divinylbenzene)		beads	can be used as adsorbant or ion exchange resin	06579-10	10 g	208
Chitin, practical		powder	acetylated amino glucose	00210-50	50 g	275
Chitosan	15,000		degree of deacetylation 84%	21161-50	50 g	275
	100K–300K	powder	amine 7–12%	00281-100	100 g	275
Poly(acrylamide/2-methacryloxyethyltri-methylammonium bromide) [80:20]	50,000		cationic polymer	21743-10	10 g	280
Poly(diallyldimethylammonium chloride)		28% AQ		19898-250	250 g	282
	240,000	powder	linear cationic cyclic polymer	17338-10	10 g	282
Poly(Allyl Amine)	15,000		water soluble cationic polymer	24826-100	100 g	281
New! Poly(allylamine hydrochloride)	120K - 200K	40% AQ	polymeric primary amine	25673-100	100 g	282
Poly(4-aminostyrene)	>150,000	powder	insol in org solvents and mineral acids	02823-1	1 g	282
Polyaniline, Emeraldine form	15,000	powder	acid doped, conductivity 2^{-4} S/cm	21288-5	5 g	282
	15,000	powder	undoped, conductivity 10^{-10} S/cm	24043-5	5 g	282
Polyaniline, water-soluble		powder	product of polyaniline with propanesultone	23614-1	1 g	282
Poly(butadiene/acrylonitrile), amine terminated				09753-100	100 g	283
Poly(3-chloro-2-hydroxypropyl-2-methac-ryloxyethyldimethylammonium chloride), 20% soln. in water		20% AQ	chlorohydroxypropyl group, can be cyclized to oxirane by mild alkali	21480-10	10 g	286
New! Poly(2-dimethylaminoethyl methacrylate), 28% soln. in toluene	200,000	liquid	water soluble cationic polymer	25996-10	10 g	286

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(ethylene glycol) bis (2-aminoethyl)	1,000	powder	can be used to conjugate proteins and drug substances for drug delivery	24285-1	1 g	288
	10,000	powder		24303-1	1 g	288
Poly(ethylene glycol) α-2-aminoethyl, μ-methoxy	2,000	solid	used for protein conjugation	24304-1	1 g	288
Polyethylenimine, branched	600	liquid	highly branched polyamine containing primary, secondary and tertiary amine groups	02371-500	500 g	294
	1,200	liquid		06088-100	100 g	294
	1,800	liquid		06089-100	100 g	294
	10,000	liquid		19850-100	100 g	294
	10,000	30% AQ		17938-100	100 g	294
	70,000	30% AQ		00618-100	100 g	294
	50K-100K	30% AQ		06090-100	100 g	294
Polyethylenimine, branched	750,000			25448-100	100 g	294
	750,000			25449-100	100 g	294
	750,000			25449-500	500 g	294
	2,000,000			25450-100	100 g	294
	2,000,000			25450-500	500 g	294
Polyethylenimine, Linear	25,000	powder		23966-2	2 g	294
Polyethyleneimine, Linear	~100,000			25414-2	2 g	294
Polyethylenimine, Linear	2,500	powder	polymer with all secondary amines	24313-2	2 g	294
	250,000	powder		24314-2	2 g	294
Polyethylenimine "Max", (MW 4,000*) High Potency Linear PEI	Nom. 4,000	solid	easy to handle, hydrochloride salt form	24885-2	2 g	295
Polyethylenimine "Max", (MW 40,000*) High Potency Linear PEI	Nom. 40,000	solid	easy to handle, hydrochloride salt form	24765-2	2 g	295
Polyethylenimine "Max", (MW 160,000*) High Potency Linear PEI	160,000	solid		25439-2	2 g	295
Polyethylenimine, branched, permethylated, permethobromide	6,300	10% AQ	high charge density, quaternary salt	21903-10	10 g	295
Poly(l-lysine hydrobromide)	40K–60K	powder		18619-50	50 mg	299
	80K–120K	0.1% AQ	cationic polymer, used for promotion of cell adhesion to surfaces	09730-25	25 ml	299
	100K–140K	powder		21430-100	100 mg	299
Poly(2-methacryloxyethyltrimethylammonium bromide),	200,000	20% AQ		21746-10	10 g	300
Poly(N-methylvinylamine)	500,000	powder	water soluble, all secondary polyamine	24038-5	5 g	302
Poly(vinylamine) hydrochloride	25,000	powder	water soluble, all primary polyamine salt	23965-1	1 g	306
Poly(2-vinyl-1-methylpyridinium bromide, 20% soln. in water	50,000	20% AQ	degree of quaternization ~50%	21477-10	10 g	307
Poly(2-vinylpyridine)	200K–400K	powder	adhesive-promoting properties	19238-10	10 g	308
	40,000	powder	water soluble at low pH	21382-10	10 g	308
	300K–400K	powder		17770-10	10 g	308
Poly(4-vinylpyridine)	50,000	powder	water soluble at low pH	00112-50	50 g	308
	150K–200K	powder		22176-50	50 g	308
Poly(2-vinylpyridine N-oxide)	300K–400K	powder	water soluble, cationic resin	01564-10	10 g	308
Poly(4-vinylpyridine N-oxide)	200,000	powder	water soluble, cationic resin	23684-10	10 g	308

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(N-vinylpyrrolidone)	2,500	powder	water-soluble polymer used as a thickener, protective colloid	16693-250	250 g	309
	4K–6K	powder		24737-250	250 g	309
	10,000	powder		03315-250	250 g	309
	40,000	powder		01051-250	250 g	309
	40,000	powder	pharmaceutical grade	01052-250	250 g	309
	1,000,000	powder		06067-250	250 g	309
Poly(N-vinylpyrrolidone/2-dimethylaminoethyl methacrylate), dimethyl sulfatequaternary	100,000	20% AQ	cationic quaternary salt	16294-100	100 g	309

Biodegradable Polymers

	Mol. Weight	Form	Comments			
Glycolide, 99.9%	116.1			17085-10	10 g	227-228
Guar Gum	1,200,000		natural water soluble polysaccharide	21255-100	100 g	278
New! Hydroxypropyl Cellulose		powder	[3–6 cP]	25727-100	100 g	278
		powder	[6–10 cP]	25728-100	100 g	279
		powder	[150–400 cP]	25729-100	100 g	279
		powder	[1,000–4,000 cP]	25730-100	100 g	279
New! Hypromellose		powder	Type 2208 [100 cP]	25731-100	100 g	279
		powder	Type 2208 [3,550 cP]	25732-100	100 g	279
		powder	Type 2208 [100,000 cP]	25733-100	100 g	279
		powder	Type 2910 [4,000 cP]	25735-100	100 g	279
		powder	Type 2910 [50 cP]	25734-100	100 g	279
Polycaprolactam	18,000		widely used in fibers	18180-250	250 g	284
	35,000	pellets		18179-250	250 g	284
Polycaprolactone	43K–50K	flakes	hydroxyl end group. mp 55–65° C	19561-500	500 g	284
Polycaprolactone diol	1,250	liquid	hydroxyl # 90mg /g of polymer	09706-500	500 g	284
	2,000	liquid	hydroxyl # 56mg /g of polymer	09694-500	500 g	284
Polycaprolactone, powdered	50,000	powder	hydroxyl end group. mp 58–60° C	25090-500	500 g	284
Poly(glycolic acid) [i.v. 1.0-2.0]	>100,000	powder	i.v. 1.0–2.00. decomposes in 6 months at 37° C at pH 9.0	06525-25	25 g	296
Poly[(R)-3-hydroxybutyrate]	~500			16930-1	1 g	296
	~1,000			16932-1	1 g	296
	~2,000			16934-1	1 g	296
	~3,000			16936-1	1 g	296
	~5,000			16938-1	1 g	296
	~10,000			16940-1	1 g	296
Poly[(-)3-hydroxybutyric acid]	500,000	powder	mp 168–176° C	16916-10	10 g	297

Poly(dl-lactide/glycolide) Polymers

	Mol. Weight	Form	Comments			
Poly(dl-lactide/glycolide)	<10,000	powder	i.v. 0.15–0.30	19076-5	5 g	298
	<10,000		i.v. 0.15–0.30	19077-5	5 g	298
	10,000	powder	i.v. 0.12–0.30	19247-5	5 g	298
	150,000	powder	i.v. 0.80–1.2	23987-5	5 g	298
	12K–16K	powder	i.v. 0.50–0.65	23986-5	5 g	298
	20,000	powder	i.v. 0.55–0.75	23989-5	5 g	298
	97,000		i.v. 0.55–0.75	25107-5	5 g	298
Poly(l-lactide/glycolide) [70:30]	<10,000	powder		16587-5	5 g	298
	10K–20K	powder		21864-5	5 g	298

Poly(dl-lactic acid) & Poly(l-lactic acid) Polymers

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(dl-lactic acid)	15,000	powder	i.v. 0.15–0.30	22505-10	10 g	297
	20K–30K	powder	i.v. 0.35–0.45	16585-10	10 g	297
	300K–600K	powder	i.v. 2.0–2.8dl/g	23976-10	10 g	297
Poly(l-lactic acid)	1,600–2,400	powder	i.v. 0.10–0.20	18580-10	10 g	298
	140K–160K	powder	i.v. 0.80–1.20	06529-1	1 g	298
	80K–100K	powder	i.v. 1.30–1.60	18402-10	10 g	298
	325K–460K	powder	i.v. 4.00–5.00	18582-10	10 g	298
	700,000	powder	i.v. >7.00	21512-10	10 g	298

Polycaprolactone & Polyethylene Glycol Diblock Polymers

	Form	Comments			
PCL(1,000)-b-PEG(1,000)	solid	biodegradable, diblock copolymers	25010-1	1 g	285
PCL(1,000)-b-PEG(2,000)	solid		25011-1	1 g	285
PCL(1,000)-b-PEG(5,000)	solid		25012-1	1 g	285
PCL(5,000)-b-PEG(1,000)	solid		25022-1	1 g	285
PCL(5,000)-b-PEG(2,000)	solid		25023-1	1 g	285
PCL(5,000)-b-PEG(5,000)	solid		25024-1	1 g	285

Polycaprolactone & Polyethylene Glycol Triblock Polymers

	Form	Comments			
PCL(1,000)-b-PEG(1,000)-b-PCL(1,000)	solid	biodegradable, triblock copolymers	25019-1	1 g	285
PCL(1,000)-b-PEG(2,000)-b-PCL(1,000)	solid		25020-1	1 g	285
PCL(1,000)-b-PEG(6,000)-b-PCL(1,000)	solid		25021-1	1 g	285
PCL(1,000)-b-PEG(10,000)-b-PCL(1,000)	solid		25013-1	1 g	285
PCL(5,000)-b-PEG(1,000)-b-PCL(5,000)	solid		25014-1	1 g	285
PCL(5,000)-b-PEG(2,000)-b-PCL(5,000)	solid		25015-1	1 g	285
PCL(5,000)-b-PEG(5,000)-b-PCL(5,000)	solid		25016-1	1 g	285
PCL(5,000)-b-PEG(10,000)-b-PCL(5,000)	solid		25025-1	1 g	285

Polylactic Acid & Polyethylene Glycol Diblock Polymers

	Form	Comments			
PEG(350)-b-PLA(300)	liquid	biodegradable, diblock copolymers	24375-1	1 g	291
PEG(1000)-b-PLA(750)	visc. liquid		24378-1	1 g	291
PEG(1000)-b-PLA(5000)	solid		24381-1	1 g	291
PEG(5000)-b-PLA(1000)	solid		24386-1	1 g	291
PEG(5000)-b-PLA(5000)	solid		24389-1	1 g	291
PEG(5000)-b-PLA(10,000)	solid		25018-1	1 g	291
PEG(10,000)-b-PLA(5,000)	solid		25017-1	1 g	291

Polylactic Acid & Polyethylene Glycol Triblock Polymers

	Form	Comments			
PLA(1000)-b-PEG(1000)-b-PLA(1000)	visc. liquid	biodegradable, triblock copolomers	24500-1	1 g	292
PLA(2000)-b-PEG(1000)-b-PLA(2000)	solid		24501-1	1 g	292
PLA(5000)-b-PEG(1000)-b-PLA(5000)	solid		24502-1	1 g	292
PLA(1000)-b-PEG(4000)-b-PLA(1000)	solid		24503-1	1 g	292
PLA(1000)-b-PEG(10,000)-b-PLA(1000)	solid		24509-1	1 g	292
PLA(5,000)-b-PEG(10,000)-b-PLA(5,000)	solid		25026-1	1 g	292
PLA(10,000)-b-PEG(10,000)-b-PLA(10,000)	solid		25027-1	1 g	292

Block Copolymers

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(dimethylsiloxane-b-ethylene oxide), methyl terminated	600	liquid	surfactant-like diblock copolymer	09780-100	100 g	287
	3,000			21870-100	100 g	287
Poly(ethylene oxide-b-propylene oxide)	1,100	liquid	water-soluble or water-dispersible polymers with surfactant properties, chains are hydroxyl terminated	16273-100	100 g	293
	2,900	liquid		16275-100	100 g	293
	3,400	liquid		16274-100	100 g	293
	8,750	waxy solid		16277-100	100 g	293
	13,300	waxy solid		16276-100	100 g	293
Polyethylene-co-vinyl acetate 70:30 (wt)	55,000			25356-25	25 g	293
	60,000			25357-25	25 g	293
	65,000			25358-25	25 g	293
	75,000			25359-25	25 g	293
Poly(styrene-b-isoprene-b-styrene)	19,000			18347-250	250 mg	303

Conductive Polymers

	Mol. Weight	Form	Comments			
Polyaniline, Emeraldine form	15,000	powder	acid doped, conductivity 2^{-4} S/cm	21288-5	5 g	282,512
	15,000	powder	undoped, conductivity 10^{-10} S/cm	24043-5	5 g	282
Polyaniline, water-soluble		powder	product of polyaniline with propanesultone	23614-1	1 g	282
Poly(3,4-ethylenedioxythiophene) / poly(styrenesulfonate), aqueous dispersion (PEDT/PSS)		liquid	conductive polymer	24215-100		288
Polypyrrole		powder	conductive polymer	21304-5	5 g	303
Poly(N-vinylcarbazole)	40,000	powder	photoconductive polymer	02428-50	50 g	306

Halogen-containing Polymers

	Mol. Weight	Form	Comments			
Dextran, hydrogenated	4K–6K		i.v. 0.055 terminal alcohol	16653-100	100 g	276
Fluorinated Ethylene Propylene Copolymer		fine powder	high release characteristics, 10–35 MFI	24778-100	100 g	278
		fine powder	high release characteristics, 35–70 MFI	24779-100	100 g	278
Halocarbon 200 Oil [Poly(chlorotrifluoroethylene)		liquid	200 centistokes	25073-100	100 ml	278
Halocarbon 400 Oil [Poly(chlorotrifluoroethylene)		liquid	400 centistokes	25074-100	100 ml	278
Halocarbon 700 Oil [Poly(chlorotrifluoroethylene)		liquid	700 centistokes	25075-100	100 ml	279
Halocarbon 1000N Oil [Poly(chlorotrifluoroethylene)		liquid	1,000 centistokes	25076-100	100 ml	279
Poly(4-bromostyrene)		powder	reactive bromine. ~43%	07030-1	1 g	282
Poly(2-chloro-1,3-butadiene)				21289-100	100 g	286
Poly(3-chloro-2-hydroxypropyl-2-methacryloxyethyldimethylammonium chloride), 20% soln. in water			chlorohydroxypropyl group can be cyclized to oxirane by mild alkali	21480-10	10 g	286
Poly(4-chlorostyrene)	250,000	powder		07041-5	5 g	286
Poly(chlorotrifluroethylene)	500–600	oil	inert liquid of high temp baths	15176-100	100 g	286
Polyethylene, chlorinated, 25% Cl				01814-100	100 g	288

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(4-iodostyrene/styrene/divinylbenzene) ~58:40:2		powder	crosslinked styrene polymer with reactive iodine group	18148-5	5 g	297,414
Polystyrene, brominated		powder	66% brominated	21305-100	100 g	303
Poly(styrenesulfonyl fluoride)				16146-5	5 g	304
Poly(tetrafluoroethylene)		60% in H_2O	dispersion; 0.05–0.5 microns	21539-100	100 g	304
		powder	35 microns	08816-100	100 g	304,415
		powder	500 microns	01344-100	100 g	304
Poly(tetrafluoroethylene propylene) (PTFE)				04615-50	50 g	305
Poly(vinyl chloride)				09708-250	250 g	306
Poly(vinylidene chloride/acrylonitrile) [80:20]	150,000	powder	polymer with barrier properties	09747-100	100 g	306
Poly(vinylidene fluoride)		powder	inert polymer, often used as a coating	15190-100	100 g	306
		powder		15191-100	100 g	306
		powder		06094-100	100 g	306
		powder		18734-100	100 g	306
Poly(4-vinylphenol) brominated, 50% Br			softens at 210° C. flame retardant	09762-50	50 g	307

Liquid Crystal Polymers

Organic compounds capable of responding to small amounts of radiant energy and undergo a phase transition with selective reflection of light. Specific colors are obtained depending on the wavelength of light which is determined by the organic crystal array "pitch length." Application areas range from thermally activated displays to sensors, and detection devices to cosmetics.

	Form	Comments			
Cholesteryl Chloride	powder	cholesteric derivaties, liquid crystal polymers	24814-50	50 g	347
Cholesteryl Nonanoate	powder		24817-50	50 g	347
Cholesteryl Oleyl Carbonate	powder		24815-50	50 g	347
Cholesteryl Propionate	powder		24816-50	50 g	347
Poly(λ-benzyl l-glutamate)	powder		21444-1	1 g	347

Miscellaneous Polymers

Poly(vinyl methyl ether), 50% methanol solution				25505-100	100 g	307

Phenol-functional Polymers

	Mol. Weight	Form	Comments			
Poly(4-vinylphenol)	1,500–7,000	powder	reactive polyphenol	06527-10	10 g	307
	9,000–11,000	powder		18979-10	10 g	307
	22,000	powder		18980-10	10 g	307
Poly(4-vinylphenol)	9,000–11,000			25447-10	10 g	307

Photoactive Polymers

	Mol. Weight	Form	Comments			
Poly(vinyl alcohol), N-methyl-4(4'-formyl-styryl)pyridinium methosulfate acetal	~45,000	13.3% AQ	photocrosslinkable polymer, high dielectric constant, used in making silkscreen printing screens	22570-75	75 g	306
Poly(N-vinylcarbazole)	40,000	powder	photoconductive polymer	02428-50	50 g	306
Poly(vinyl cinnamate)		powder	photocrosslinkable polymer	02648-10	10 g	306

Poly(ethylene glycol) Polymers

	Mol. Weight	Comments	Catalog #	Size	Page
Poly(ethylene glycol)	200		01112-250	250 g	288
	300		01110-250	250 g	288
	400		01109-250	250 g	288
	600		00684-250	250 g	288
	1,000		00682-250	250 g	288
Poly(ethylene glycol)	1,450		00679-250	250 g	288
	3,400		06102-250	250 g	288
	7,500		06103-250	250 g	288
	10K-16K		22567-250	250 g	288
	2,000		25360-250	250 g	288
	20,000		22568-250	250 g	288
	1,450	pharmaceutical grade	01102-100	100 g	288
	8,000	pharmaceutical grade	17243-100	100 g	288
Poly(ethylene glycol) (200) adipate	530	reaction product for one mole (adipic acid) and two moles (PEG 200)	21509-100	100 g	288
Poly(ethylene glycol) bis (2-aminoethyl)	~1,000	can be used to conjugate proteins and drug substances for drug delivery	24285-1	1 g	288
	~10,000		24303-1	1 g	288
Poly(ethylene glycol) α-2-aminoethyl, ω-methoxy	2,000	used for protein conjugation	24304-1	1 g	289
Poly(ethylene glycol)-bisphenol A diglycidyl ether adduct	18,500		04686-250	250 g	289
Poly(ethylene glycol) (n) diacrylate	200		00669-250	250 g	242,289
	400		01871-250	250 g	242,289
	4,000		15246-1	1 g	242,289
Poly(ethylene glycol) (n) diglycidyl ether	200	crosslinker for amine-, hydroxyl- and carboxyl- functional polymers	08209-100	100 g	289
	400		08210-100	100 g	289
	600		08211-100	100 g	289
	1,000		24047-100	100 g	289
Poly(ethylene glycol) (n) dimethacrylate	200		00096-100	100 g	289
	400		15179-100	100 g	289
	1,000		15178-100	100 g	289
Poly(ethylene glycol) (n) dimethyl ether	~500		25405-25	25 g	289
	1,000		17032-25	25 g	289
	2,000		17033-25	25 g	289
Poly(ethylene glycol) (n) distearate	200		02298-100	100 g	290
	400		01048-100	100 g	290
	6,000		19234-100	100 g	290
Poly(ethylene glycol) (750) monocarboxymethyl ether monomethyl ether	750	carboxylic acid-terminated, can be coupled to molecules with carbodiimides	21483-500	500 mg	290
Poly(ethylene glycol) (n) monomethacrylate	200		16712-100	100 g	290
	400		16713-100	100 g	290
Poly(ethylene glycol) monomethyl ether	350	hydroxyl group at one end	04200-500	500 g	290
	550		04457-500	500 g	290
	750		00626-500	500 g	290
	1,900		04242-500	500 g	290
	5,000		05986-500	500 g	290
Poly(ethylene glycol) (n) monomethyl ether monomethacrylate	200		16664-100	100 g	242,290
	400		16665-100	100 g	242,290
	1000		16666-100	100 g	242,290

	Mol. Weight	Comments	Catalog #	Size	Page
Poly(ethylene glycol) (n) monomethyl ether, mono(succinimidyl succinate) ester	1,900		21482-500	500 mg	291
	5,000		18000-500	500 mg	291
Poly(ethylene glycol) (200) mono-stearate	200		03142-100	100 g	291
Poly(ethylene glycol terephthalate)	20K – 30K	used in films, fibers and drink bottles	04301-250	500 g	292

Reactive Polymers

Aldehyde and Ketone Functional Polymers

	Mol. Weight	Form	Comments			
Polyacrolein	200K–2M	powder	due to intermolecular acetals, acts as if heavily crosslinked	04287-10	10 g	280
Poly(vinyl methyl ketone)		powder	reactive carbonyl	04320-10	10 g	307

Carboxylic Acid Anhydride Functional Polymers

	Mol. Weight	Form	Comments			
Poly(butadiene/maleic anhydride) 1:1 (molar)	10K–15K	25% in acetone	can be reacted at anhydride or backbone olefin	07788-500	500 g	283
Poly(ethylene/maleic anhydride) 1:1 (molar)	400,000	powder	reacts with alcohols or amines	02308-50	50 g	293
Poly(maleic anhydride)	~10,000	powder	reacts with alcohols or amines	02348-5	5 g	300
Poly(maleic anhydride 1-octadecene) 1:1 (molar)	30K–50K	powder	reacts with alcohols or amines, hydrophobic	05152-100	100 g	300
Poly(styrene/maleic anhydride)	7,500		i.v. ~0.80	03497-500	500 g	304
	9,500		i.v. ~0.80	03498-500	500 g	304

Carboxylic Acid Chloride Functional Polymers

	Mol. Weight	Form	Comments			
Poly(acryloyl chloride), 25% soln. in dioxane	10,000	25% in dioxane	reacts with alcohols or amines	04293-10	10 g	281
Poly(methacryloyl chloride), 25% soln. in dioxane	~155K	25% in dioxane	reacts with alcohols or amines	04315-10	10 g	300

Hydroxyl-Functional Polymers

	Mol. Weight	Form	Comments			
Poly(1-glycerol methacrylate)		waxy solid	hydrophilic, water swellable polymer, probably crosslinked	16855-10	10 g	295-296
Poly(2-hydroxyethyl methacrylate)	200,000	powder		09689-25	25 g	297
	200,000	12% in Ethanol	water swellable	18894-100	100 ml	297

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(vinyl alcohol)	6,000	powder	80% hydrolyzed	22225-500	500 g	305
	25,000	powder	88% hydrolyzed	02975-500	500 g	305
	25,000	powder	98% hydrolyzed	04397-500	500 g	305
	78,000	powder	88% hydrolyzed	15132-500	500 g	305
	78,000	powder	98% hydrolyzed	15130-500	500 g	305
	78,000	powder	99.7% hydrolyzed	15129-500	500 g	305
	108,000	powder	99.7% hydrolyzed	04324-500	500 g	305
	125,000	powder	88% hydrolyzed	04398-500	500 g	305
	133,000	powder	99% hydrolyzed	02815-500	500 g	305

Nitrile Functional Polymers

	Mol. Weight	Form	Comments			
Poly(butadiene/acrylonitrile) 67:33	63K	solid	widely used nitrile rubber	06561-500	500 g	283

Oxirane Functional Polymers

	Mol. Weight	Form	Comments			
Poly(glycidyl methacrylate), 10% soln. in MEK	25,000	10% in MEK	reacts with carboxyls, hydroxyls or amines	06524-5	5 g	296

Styrenic Polymers

	Mol. Weight		Comments			
Poly(4-iodostyrene/styrene/ divinylbenzene) ~58:40:2			crosslinked styrene polymer with reactive iodine group	18148-5	5 g	297,414
Poly(α-methylstyrene)	5,000			07630-500	500 g	301
Poly(4-methylstyrene/styrene) [90:10]	50K			19831-10	10 g	301
Polystyrene	300K	atactic pellets		00574-100	100 g	303
	800–5,000	atactic flakes	softening point 125°	23637-100	100 g	303
	50,000	atactic flakes	biomodal with MW ~50,000 & 1500 (50:50)	18544-100	100 g	303
Polystyrene, brominated			66% brominated	21305-100	100 g	303

Water Soluble Polymers

	Mol. Weight	Form	Comments			
Cellulose, ethyl ether	160K			02354-500	500 g	274
	160K			05429-500	500 g	274
Cellulose, ethyl hydroxyethyl ether				05431-100	100 g	274
Cellulose, hydroxyethyl ether	~90,000	powder	water-soluble cellulose ether, used as a binder and thickening agent	05570-500	500 g	275
	720,000	powder		05569-500	500 g	275
	1,000,000	powder		05568-500	500 g	275
Cellulose, methyl hydroxyethyl ether	110K	2% soln. in H_2O	cellulose derivative	21275-500	500 g	275
Chitosan	~15,000	powder	degree of deacetylation 84%	21161-50	50 g	275
	100K–300K	powder	amine 7-12%	00281-100	100 g	275
Dextran	15K–20K	powder	i.v. 0.10–0.14	01341-100	100 g	276
	100K–200K	powder	i.v. 0.343	05056-100	100 g	276
	200K–300K	powder	i.v. 0.4–0.5/37° C	22500-100	100 g	276
	3M–7M	powder		05059-100	100 g	276
Dextran, DEAE ether	500,000			15757-50	50 g	276
Dextran, hydrogenated	4K–6K	powder	i.v. 0.055 terminal alcohol	16653-100	100 g	276
Dextran sulfate, sodium salt	500,000	powder	sulfur 19%, anionic dextran derivative	00407-100	100 g	276

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Guar Gum	1,200,000	powder	natural water soluble polysaccharide	21255-100	100 g	278
Polyacrylamide	10,000	50% AQ	nonionic water soluble polymer; high molecular weight polymers find application as flocculants	22581-250	250 g	280
	600K–1M	10% AQ		19901-250	250 g	280
	5,000,000	1% AQ		21485-250	250 g	280
	5M–6M	powder		02806-250	250 g	280
	18,000,000	powder		18522-100	100 g	280
Poly(acrylamide/acrylic acid), Na Salt	200,000	powder		04652-250	250 g	280
	>10,000,000			18545-250	250 g	280
	200,000	powder	anionic acrylamide polymer	02220-250	250 g	280
Poly(acrylamide/acrylic acid), potassium salt, crosslinked		powder	active ingredient of low-bulk diapers, potassium salt	24620-250	250 g	280
Poly(acrylamide/2-methacryloxyethyltri-methylammonium bromide) [80:20]	50,000	20% AQ	cationic polymer	21743-10	10 g	280
Poly(acrylic acid)	2,000	63% AQ		06513-250	250 g	281
	5,000	50%AQ		06519-250	250 g	281
Poly(acrylic acid)	50,000	25% AQ		00627-250	250 g	281
	345,000	25% AQ		03326-250	250 g	281
	450,000	powder		03312-100	100 g	281
	1,000,000	powder		06500-100	100 g	281
	4,000,000	powder		06501-100	100 g	281
Poly(acrylic acid) ammonium salt	250,000	powder		03311-25	25 g	281
Poly(acrylic acid) sodium salt	~2,000	powder	water-soluble anionic polymer, low molecular weights used as pigment dispersants, high MW's used as flocculants	06568-250	250 g	281
	~3,000	40% AQ powder		18608-250	250 g	281
	~5,000	40% AQ		18609-250	250 g	281
	~6,000	powder		06567-250	250 g	281
	~60,000	35% AQ		18611-250	250 g	281
	~225,000	20% AQ		18613-250	250 g	281
Poly(acrylic acid), sodium salt, crosslinked				24619-250	250 g	281
Poly(diallyldimethylammonium chloride)	240,000	powder	linear cationic cyclic polymer	17338-10	10 g	282
Poly(Diallyl Dimethyl Ammonium Chlo-ride)	8,500	28% solid in H2O	supplied as hydrochloride salts	24828-100	100 g	282
Poly(Allyl Amine)	15,000	15% solid in H2O	water soluble cationic polymer	24826-100	100 g	281
Poly(butadiene/maleic acid) 1:1 (molar)	10K–15K	42% AQ	anionic polymer capable of anhydride or backbone unsaturation reaction	07787-500	500 g	283
Poly(n-butyl acrylate/2-methacryloxyeth-yltrimethylammonium bromide) [80:20]		20% AQ	cationic polymer	21744-10	10 g	283
Poly(3-chloro-2-hydroxypropyl-2-methac-ryloxyethyldimethylammonium chloride), 20% soln. in water		20% AQ	chlorohydroxypropyl group can be cyclized to oxirane by mild alkali	21480-10	10 g	286
New! Poly(2-dimethylaminoethyl meth-acrylate), 28% soln. in toluene	200,000	liquid	water soluble cationic polymer	25996-10	10 g	286
Poly(ethyl acrylate/acrylic acid), [50:50]		20% in EtOH powder		19914-10	10 g	287
				21056-5	5 g	287
Poly(ethylene/acrylic acid) [92:8]	65K			06517-100	100 g	287
Poly(ethylene oxide)	5,000,000	waxy solid		04031-500	500 g	292

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(ethylene oxide)	100,000	waxy solid		06104-500	500 g	292
	200,000	waxy solid		17503-500	500 g	292
	300,000	waxy solid		06105-500	500 g	292
	600,000	waxy solid		06106-500	500 g	292
	1,000,000	waxy solid		21295-500	500 g	292
	4,000,000	waxy solid		04030-500	500 g	292
	8,000,000	waxy solid		21296-500	500 g	292
Poly(ethylene oxide-b-propylene oxide)	1,100	liquid	water-soluble or water-dispersible polymers with surfactant properties, chains are hydroxyl terminated	16273-100	100 g	293
	2,900	liquid		16275-100	100 g	293
Poly(ethylene oxide-b-propylene oxide)	3,400	liquid		16274-100	100 g	293
	8,750	waxy solid		16277-100	100 g	293
	13,300	waxy solid		16276-100	100 g	293
Poly(2-ethyl-2-oxazoline)	5,000	powder	neutral water soluble polymer, can be hydrolyzed to linear polyethylenimine	24066-50	50 g	295
	50,000	powder		17808-100	100 g	295
	200,000	powder		24882-100	100 g	295
	500,000	powder		17810-100	100 g	295
Poly(1-glycerol methacrylate)		waxy solid	hydrophilic, water swellable polymer, probably crosslinked	16855-10	10 g	295-296
Poly(2-hydroxyethyl methacrylate/ methacrylic acid) [90:10]		solid	water soluble in presence of alkali	08725-10	10 g	297
Poly(2-hydroxypropyl methacrylate)				09690-10	10 g	297
Poly(l-lysine hydrobromide)	40K–60K	powder		18619-50	50 mg	299
	80,000	0.1% AQ	cationic polymer, used for promotion of cell adhesion to surfaces	09730-25	25 ml	299
	120,000	powder		21430-100	100 mg	299
Poly(maleic acid), 50% soln. in water	800–1,200	50% AQ		09732-10	10 g	300
Polymethacrylamide	5,000	powder	water soluble polyamide	16144-10	10 g	300
Poly(methacrylic acid)	100,000	solid	water soluble polymer	00578-50	50 g	300
Poly(methacrylic acid) ammonium salt, 30% soln. in water	15,000	30% AQ	forms insoluble salts with polyamines	21169-25	25 g	300
Poly(methacrylic acid) sodium salt, 30 % soln. in water	15,000	30% AQ	forms insoluble salts with polyamines	21170-25	25 g	300
Poly(2-methacryloxyethyltrimethylammo-nium bromide)	200,000	20% AQ		21746-10	10 g	300
Poly(N-methyl N-vinyl acetamide) homo-polymer		powder	may be converted to poly (N-methyl vinyl amine) by hydrolysis	24810-50	50 g	302
Poly(oxyethylene) sorbitan monolaurate (Tween 20®)	1,227.5	liquid	surfactant, Tween® 20	06110-100	100 g	61,302
Poly(N-iso-propylacrylamide)	40,000	solid	soluble at RT, insoluble above 40° C	21458-10	10 g	302
Polypropylene, Chromatographic Grade			chromatographic grade	04342-100	100 g	302,414
			atactic	23968-100	100 g	302
	220,000	flakes	isotactic	06536-100	100 g	302
Poly(styrenesulfonic acid)	70,000	30% AQ	ionic polymer in acid form	08770-250	250 g	304
Poly(styrenesulfonic acid), sodium salt	75,000	powder	ionic polymer in salt form	08772-25	25 g	304
	1,000,000	powder		08773-25	25 g	304
Poly(styrenesulfonic acid/maleic acid), sodium salt	15,000	25% AQ	can be used as a pigment dispersant	11795-25	25 g	304
	20,000	solid	can be used as a pigment dispersant	18407-25	25 g	304
Poly(N-vinyl acetamide) homopolymer), Crosslinked			moderately water soluble, stable	24807-50	50 g	305
Poly(N-vinyl acetamide)	~4,060,000	powder	moderately water soluble, stable	24808-50	50 g	308
Poly(vinyl acetate)	90,000			06069-500	500 g	305

	Mol. Weight	Form	Comments	Catalog #	Size	Page
Poly(vinyl acetate), 40% hydrolyzed	72,000		40% hydrolyzed	17561-25	25 g	305
Poly(vinyl alcohol)	6,000	powder	80% hydrolyzed	22225-500	500 g	305
	25,000	powder	88% hydrolyzed	02975-500	500 g	305
	25,000	powder	98% hydrolyzed	04397-500	500 g	305
	78,000	powder	88% hydrolyzed	15132-500	500 g	305
Poly(vinyl alcohol)	78,000	powder	98% hydrolyzed	15130-500	500 g	305
	78,000	powder	99.7% hydrolyzed	15129-500	500 g	305
	108,000	powder	99.7% hydrolyzed	04324-500	500 g	305
	125,000	powder	88% hydrolyzed	04398-500	500 g	305
	133,000	powder	99% hydrolyzed	02815-500	500 g	305
Poly(vinyl alcohol), N-methyl-4(4'-formyl-styryl)pyridinium methosulfate acetal	45,000	13.3% AQ	photocrosslinkable polymer, high dielectric constant, used in making silkscreen printing screens	22570-75	75 g	306
Poly(vinylamine) hydrochloride	25,000	powder	all primary amine	23965-1	1 g	306
Poly(vinyl methyl ether), 50% aqueous solution	~30,000	50% AQ		03032-500	500 g	307
Poly(2-vinyl-1-methylpyridinium bromide, 20% soln. in water	50,000	20% AQ	degree of quaternization ~50%	21477-10	10 g	307
Poly(vinylphosphonic acid), 30% Soln.	24,000	30% AQ	polydispersity ~1.24	24297-10	10 g	307
Poly(2-vinylpyridine)	200K–400K	powder	adhesive-promoting properties	19238-10	10 g	308
Poly(vinyl phosphoric acid), sodium salt	200,000	solid	straight chain; 5% phosphorus	04391-5	5 g	308
Poly(2-vinylpyridine)	40,000	powder	water soluble at low pH	21382-10	10 g	308
	300K–400K	powder		17770-10	10 g	308
Poly(4-vinylpyridine)	50,000	solid	water soluble at low pH	00112-50	50 g	308
	150K–200K	solid		22176-50	50 g	308
Poly(N-vinyl acetamide-co-sodium acrylate)		powder	moderately water soluble, stable	24809-50	50 g	308
Poly(2-vinylpyridine N-oxide)	300K–400K	powder	water soluble cationic resin	01564-10	10 g	308
Poly(4-vinylpyridine N-oxide)	200,000	powder	water soluble cationic resin	23684-10	10 g	308
Poly(N-vinylpyrrolidone)	2,500	powder	water-soluble polymer used as a thickener, protective colloid	16693-250	250 g	309
	4,000–6,000			24737-250	250 g	309
	10,000	powder		03315-250	250 g	309
	40,000	powder		01051-250	250 g	309
	40,000		pharmaceutical grade	01052-250	250 g	309
	1,000,000	powder		06067-250	250 g	309
Poly(N-vinylpyrrolidone/2-dimethyl-aminoethyl methacrylate), dimethyl sulfatequaternary	100,000	20% AQ	cationic quaternary salt	16294-100	100 g	309
Poly(N-vinylpyrrolidone/vinyl acetate), 50% soln. in isopropanol	25,000		hydrophilic neutral polymer	09718-100	100 g	309
	45,000			09717-100	100 g	309
	66,000			09716-100	100 g	309
Poly(vinylsulfonic acid) sodium salt,	4K–6K	25% AQ	anionic polymer	04392-100	100 g	309

NOTES

NOTES

	Catalog #	Size

B

Biodegradable Polymers Kit . . . . . 18401-1 — 1 kit

Useful for studies involving bio-erodable drug matrices, biodegradable sutures and implant materials, as well as for situations requiring polymers that can biodegrade when placed in the soil.

Kit Contains 5g each of the following:

- Poly(glycolic acid) [26202-08-4] MW 100,000 i.v 1.0–2.0 *(Cat. #06525)*
- Poly(dl-lactic acid) [26969-66-4] MW 20,000 i.v ~0.4 *(Cat. #16585)*
- Poly(l-lactide-co-glycolide) [30846-39-0] MW 5,000 i.v ~0.2 *(Cat. #16587)*
- Poly(l-lactic acid) [33135-50-1] MW 100,000 i.v ~1.5 *(Cat. #18402)*

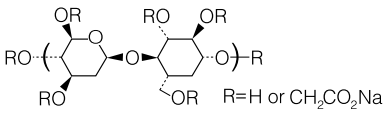
These products are offered for research purposes only, not for use in or on humans as a drug or device.

C

Cellulose, carboxymethyl ether, sodium salt [9004-32-4] *A5g*

n_D^{25} 1.3355 Degree of Substitution = 0.7 TSCA

Anionic water-soluble gum used as binder, thickener.



		Catalog #	Size
MW 80,000	Viscosity 2% AQ = Max 18 cps	06140-250	250 g
MW 250,000	Viscosity 1% AQ = 1000–2800 cps pH 7.0	06138-250	250 g
MW 700,000	Viscosity 1% AQ = 1500–3000 cps pH 6.5–8.5	06139-250	250 g

Cellulose, cyanoethyl ether [9004-41-5] *U2g* . . . . . 04687-10 — 10 g

MW 90,000–117,000 Tg 180° TSCA

R = CH_2CH_2CN

Solvent-soluble cellulose ether. High dielectric constant. Soluble in polar solvents, acetone, chloroform and pyridine.

Cellulose, ethyl ether [9004-57-3] *H4g*

n_D^{21} 1.3355 50 cps (5% soln. in 80:20 toluene/ethanol) Tg 43° TSCA

R= $-CH_2CH_3$

Solvent-soluble cellulose ether. Soluble in lower alcohols, MDC, esters, toluene.

	Catalog #	Size
Degree of Substitution = 2.21–2.28 powder	02354-500	500 g
Degree of Substitution = 2.41–2.51	05429-500	500 g

Cellulose, ethyl hydroxyethyl ether [9004-58-4] *A2g* . . . . . 05431-100 — 100 g

10 – 20 cps (measured as 5% soln. in 80:20 toluene/ethanol) TSCA

R = $-CH_2CH_3$ $HOCH_2CH_2-$

Extra low viscosity, powder. Solvent-soluble cellulose ether.

	Catalog #	Size
Cellulose, hydroxyethyl ether [9004-62-0] *H5g* powder TSCA R = $HOCH_2CH_2$- Water-soluble cellulose ether, used as a binder and thickening agent.		
~90,000 Viscosity 5% AQ = 75–150 cps	05570-500	500 g
~720,000 Viscosity 2% AQ = 4,500–6,500 cps	05569-500	500 g
~1,000,000 Viscosity 1% AQ = 1,500–2,500 cps	05568-500	500 g
Cellulose, methyl hydroxyethyl ether [9032-42-2] *A2g*	21275-500	500 g
8,000 cps (2% soln. in H_2O) TSCA R = $(CH_2CH_2O)xH_1CH_3$ or H Water-soluble cellulose derivative.		
Chitin, practical [1398-61-4] *H5g*	00210-50	50 g
TSCA Chitin is a naturally derived acetylated amino glucose.		
Chitosan [9012-76-4] *A2g* TSCA Cationic polymer prepared by deacetylation of chitin. Soluble in water at low (4–6) pH. Soluble in water at low (4–6) pH; dilute organic and inorganic acids.		
Purified Powder MW ~15,000 Degree of deacetylation ~84%	21161-50	50 g
Practical [MW 100,000–300,000] Amine 7–12%	00281-100	100 g

Cyclic Olefin Copolymers (COC) [26007-43-2]
(Ethylene-Norbornene Copolymer)

Cyclic Olefin Copolymers are high transparency, low specific gravity, high heat resistant and have excellent optical properties and superior water vapor barrier characteristics. Combined with outstanding stiffness/strength and favorable sterilization properties, they have found applications ranging from FDA approvals for pharmaceutical and food applications to optical applications and electronics materials. Whether used by itself or as a modifier for other resins, the ethylene-norbornene copolymer offers the optical clarity of polymethylmethacryate (pMMA), the heat resistance of polycarbonate (PC) and superior dimensional stability.

Properties:

- High transparency
- Outstanding moisture barrier
- High rigidity and strength
- Variable heat distortion resistance up to 170° C
- Excellent biocompatibility
- Very good resistance to acids and alkalis and polar organic solvents
- Low density
- Very good electrical insulation properties
- Exceptionally low moisture absorption
- Low birefringence

HDT = Heat Deflection Temperature

HDT = 75° C Tg 80° C d 1.02	24750-100	100 g
HDT = 130° C Tg 140° C d 1.02	24749-100	100 g
HDT = 150° C Tg 160° C d 1.02	24748-100	100 g
HDT = 170° C Tg 180° C d 1.02	24746-100	100 g

	Catalog #	Size
β-Cyclodextrin [7585-39-9] *VWX5g* (cycloheptaamylose) MW 1,135 Cavity Diameter: 7–8 A° TSCA Host in host/guest complexes. Soluble in water, lower alcohols 99%.	00355-25	25 g

D

Dextran [9004-54-0] *A2g*
(poly[(1,6)-α-d-glucose]) TSCA $[C_6H_{10}O_5]_n$
Water soluble carbohydrate with many pharmaceutical and technical uses. Soluble in lower alcohols.

MW 15K–20K	i.v. 0.10–0.14	powder	01341-10	10 g
MW 15K–20K	i.v. 0.10–0.14	powder	01341-100	100 g
MW 100K–200K	i.v. 0.343	Nonpyrogenic, powder	05056-100	100 g
MW 200K–300K	i.v. 0.4–0.5/37° C	powder	22500-100	100 g
MW 3M–7M	Viscosity 1% AQ = 3.96 cps	powder	05059-100	100 g
MW 70K	Viscosity 0.24–0.29 dL/g water, lower alcohols (Meets USP Specifications)		25339-100	100 g
			25339-500	500 g

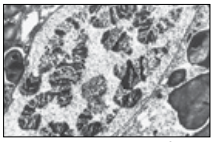
Dextran, DEAE ether [9015-73-0] *A2g* (diethylaminoethyl ether) MW 500,000 Degree of substitution ~70% $[-C_6H_9O_4[OCH_2CH_2N(CH_3)_2]]_n$ Cationic dextran derivative.	15757-50	50 g
Dextran, FITC [60842-46-8] *A2g* (Fluorescein isothiocyanate) MW 150,000 Yellow-orange crystalline powder Valuable materials for studying permeability and microcirculation in vivo. These are used to trace neuronal projections and active transport in live and unfixed tissue and as neuronal tracers in a variety of species. *J. Jonsson et al, 6th Europ. Conf. Microcirculation, Aalbong 1970, 214. Microvascular Res., 3, 440, (1971); Trends Nerosci, 13, 14 (1990); Proc. Natl. Acad. Sci. USA 92, 11500 (1995); Acla Neuropath. 59, 63, (1983). Cole, L., et al., J. Cell. Sci., v. 96, 721 (1990) [Internalisation of FITC and FITC-dextran by suspension cultured plant cells], Oliver, J.M., et al., Meths. Enzymol., v. 108, 336 (1984) [Study of fluid pinocytosis in leukocytes]*	15759-500	500 mg
Dextran, hydrogenated *U2g* MW 4,000–6,000 Viscosity i.v. 0.055 Properties are similar to dextran but aldehyde at chain ends is reduced to alcohol.	16653-100	100 g
Dextran sulfate, sodium salt [9011-18-1] *A2g* MW 500,000 Viscosity 0.1–0.7 in 1M AQ NaCl Sulfur 19% pH of AQ 6.9 TSCA $[-C_6H_9O_4(OSO_3N_a)]_n$ Anionic dextran derivative.	00407-100	100 g

	Catalog #	Size

E

Epoxy Resins

Araldite resins (modified epoxy resins)
TSCA
C_6H_4-1,2,-$[CO_2(CH_2)_3CH_3]_2$
Technical Data Sheet #128


Salivary Gland Cell from a Drosophila larva showing polytene chromosomes in the nucleus.

Grade 502	WPE 233–250	[84-74-2]	*HO5g*	00552-500	500 g
Grade 6005	WPE 182–189	[3101-60-8]	*HO7g*	02116-500	500 g

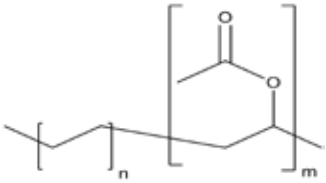
D.E.R. (Dow epoxy resins) [26142-30-3]
TSCA

Grade 732	WPE 310–330	MW ~600	Viscosity 55–100 cps *HO7g*	02922-450	450 g
Grade 736	WPE 175–205	MW ~300	Viscosity 30–60 cps *H2g*	02923-450	450 g

Epon® Resin 828 [25068-38-6] *HO2g* . . . . . 02334-500 500 g
(Bisphenol A diglycidyl ether) MW ~377 Viscosity 10,000–16,000 cps WPE: 185–192 TSCA
Standard epoxy resin used in formulation, fabrication and fusion technology. Widely used for embedding and potting. When cross-linked or hardened with appropriate amine curing agents, very good mechanical adhesive, dielectric and chemical resistance properties are obtained.

Epon® Resin 1001F [25036-25-3] *HO2g* . . . . . 24305-500 500 g
(Bisphenol A diglycidyl ether) MW 1075 Viscosity 7.0–9.6 cps WPE: 525–550
Higher MW epoxy resin cured by amine catalyst and used for embedding. Viscous liquid.

Ethylene Vinyl Acetate *H4g* . . . . . 24763-50 50 g
Tg -7° C (Soft, flexible polymer) Solids Content: 99 +/- 1%
White, free flowing powder Copolymer available as a free flowing powder that can easily be redispersed to form a latex dispersion. Powder is stablized with a vinyl alcohol to allow it to remain free flowing but easily redispersible in water.



Composition: Approximately 20 weight % ethylene and 80 weight % vinyl acetate.

Particle Size: 1–7 micron dominant sizes; max 4% over 40 mesh.

	Catalog #	Size

F

Fluorinated Ethylene Propylene Copolymer
mp (ASTM-D1457) 240 +/- 9° C Fine white powder
Fluorinated copolymers of ethylene and propylene improve overall performance when formulated into plastics, elastomeric polymers, paints and coatings or inks and lubricants.

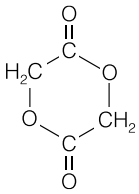
Advantages:
This product exhibits high release characteristics, excellent wear and mar resistance and slip resistance properties when used alone or in blends with other materials. The inherent toughness and high fluorine content imparts improved tear resistance, surface smoothness and flammability resistance in coating and ink formulations.

Properties:
- Service Temperature Range: (ASTM-D1457) -200° C – 260° C
- Mean Particle Size: 4 microns
- Polymer Specific Gravity: 2.2 – 2.3
- Bulk Density: 350 – 550 grams/liter

Melt Flow Index 10 – 35 MI	24778-100	100 g
Melt Flow Index 35 – 70 MI	24779-100	100 g

G

Glycolide, 99.9% [502-97-6] *B6bf* . . . . . 17085-10 10 g
17085-50 50 g
MW 116.1 mp 84° TSCA
For preparation of biodegradable polymers.



Guar Gum [9000-30-0] *A2g* . . . . . 21255-100 100 g
MW 1.2 million Viscosity 1% AQ ~6000 cps TSCA
Natural water-soluble polysaccharide.

H

Halocarbon 200 Oil [Poly(chlorotrifluoroethylene) [9002-83-9] . . . . . 25073-50 50 ml
25073-100 100 ml
n_D^{20} 1.412 d 1.95 g/mL Viscosity at 100° F (37.8° C): 200 centistokes (390 cPs) Pour Point: 10° F (-12° C) Cloud Point: 35° F (2° C) Clear, colorless liquid
Inert, non-flammable lubricating oil. Polymer is a blend of oligomers. Also used as an inert medium in transgenic studies of fruit fly Drosophilia embryos.
E. Cornell et al, Review of Scientific Instruments, 79, 013705 (2008)

Halocarbon 400 Oil [Poly(chlorotrifluoroethylene) [9002-83-9] . . . . . 25074-50 50 ml
25074-100 100 ml
n_D^{20} 1.412 d 1.95 g/mL Viscosity at 100° F (37.8° C): 400 centistokes (780 cPs) Pour Point: 15° F (+/- 10); -9° C (+/- 5) Cloud Point: 50° F (10° C) Clear, colorless liquid
Inert, non-flammable lubricating oil. Polymer is a blend of oligomers. Also used as an inert medium in transgenic studies of fruit fly Drosophilia embryos.
E. Cornell et al, Review of Scientific Instruments, 79, 013705 (2008)

	Catalog #	Size
Halocarbon 700 Oil [Poly(chlorotrifluoroethylene) [9002-83-9]	25075-50	50 ml
	25075-100	100 ml

n_D^{20} 1.414 d 1.95 g/mL Viscosity at 100° F (37.8° C): 700 centistokes (1,365 cPs) Pour Point: 40° F (+/- 10); 5° C (+/- 5) Cloud Point: 55° F (13° C) Clear, colorless liquid
Inert, non-flammable lubricating oil. Polymer is a blend of oligomers. Also used as an inert medium in transgenic studies of fruit fly Drosophilia embryos.
E. Cornell et al, Review of Scientific Instruments, 79, 013705 (2008)

Halocarbon 1000N Oil [Poly(chlorotrifluoroethylene) [9002-83-9]	25076-50	50 ml
	25076-100	100 ml

n_D^{20} 1.415 d 1.95 g/mL Viscosity at 100° F (37.8° C): 1,000 centistokes (1,950 cPs) Pour Point: 50° F (+/- 10); 10° C (+/- 5) Clear, colorless liquid
Inert, non-flammable lubricating oil. Polymer is a blend of oligomers. Also used as an ultraviscous solvent for ^{1}H NMR spectroscopy to better identify individual components in a complex mixture. The ultraviscous polymer solvent (mixed as 80% Halocarbon / 20% $CDCl_3$) greatly reduces the molecular tumbling of small molecules, thereby making the nuclear Overhauser effect (NOE) very large and of negative sign. In a NOESY experiment, the spectrum of the target molecule can be cleanly extracted from the mixture.
Simpson, A. J., et al, Analytical Chemistry, Vol. 80, No. 1, January 1, 2008, pg 186-194

New! Hydroxypropyl Cellulose *A4g*
hydroxypropyl ether white to pale yellow powder
HPC is a hydrophilic polymer used for drug encapsulants, opthalmic lubricants and transdermal patches. Also used as a general thickener. Viscosity measured as a 2% solution in water at 20° C.

[3–6 cP]	25727-100	100 g
	25727-250	250 g
[6–10 cP]	25728-100	100 g
	25728-250	250 g
[150–400 cP]	25729-100	100 g
	25729-250	250 g
[1,000–4,000 cP]	25730-100	100 g
	25730-250	250 g

New! Hypromellose *H4g*
Hydroxypropyl methylcellulose (Hypromellose), is a propylene glycol ether of methylcellulose. It is water soluble, and useful as an emulsifier, thickening agent, ophthalmic lubricant, excipient, coating and food additive.

Type 2208 refers to a methoxy concentration of 19–24% and a hydroxypropoxy concentration of 4 to 12%. Type 2910 refers to a methoxy concentration of 28–30% and a hydroxypropoxy concentration of 7-12%.

Type 2208 [100 cP]	25731-100	100 g
	25731-250	250 g
Type 2208 [3,550 cP]	25732-100	100 g
	25732-250	250 g
Type 2208 [100,000 cP]	25733-100	100 g
	25733-250	250 g
Type 2910 [50 cP]	25734-100	100 g
Type 2910 [4,000 cP]	25735-100	100 g
	25735-250	250 g

	Catalog #	Size

P

Polyacetal resin [9002-81-7] *A2g* . . . . . 02562-500 500 g
(polyformaldehyde) MW ~41,000 mp 175° d 1.47 TSCA

Polyacrolein [25068-14-8] *A2g* . . . . . 04287-10 10 g
MW 200,000–2 million by viscosity TSCA
Reactive polymer. Insoluble as supplied because of extensive inter- and intramolecular acetal linkages. Polyacrolein can be solubilized by reaction with reagents such as sodium bisulfite, hydrazine, etc. Insoluble in most of the organic solvents.

Polyacrylamide [9003-05-8]
d 1.302 for AQ Solution Tg 165° TSCA
$[-CH_2CH(CONH_2)-]_n$
Important nonionic water-soluble polymer. High MW polymer is used primarily as a flocculant. Unit weights are weights of solution. Tg of high MW (>100,000) polymers = 165°. Unit weights are weights of solution. Soluble in water, morpholine.

MW 10K	(25g polymer)	50% soln. in water	Viscosity of 15% AQ 5.5 - 9 cps	*H4g*	22581-50	50 g
MW 10K	(50g polymer)	50% soln. in water	Viscosity of 15% AQ 5.5 - 9 cps	*H4g*	22581-100	100 g
MW 600K – 1M	(25g polymer)	10% soln. in water	Viscosity of 15% AQ 5.5 - 9 cps	*M6g*	19901-250	250 g
					19901-1	1 kg
MW 5M	(2.5g polymer)	1% soln. in water	Viscosity of 0.1% AQ 3.8 cps	*A2g*	21485-250	250 g
MW 5M - 6M	powder		Viscosity of 0.1% AQ 2.2 - 2.7 cps	*A2d*	02806-250	250 g
MW 18M	powder		Viscosity of 0.2% AQ 1200 cps	*A2d*	18522-100	100 g

Poly(acrylamide/acrylic acid), Na Salt [25085-02-3]
TSCA
Residual monomer. <.03% anionic acrylamide polymer

90:10	MW 200,000		Viscosity 10% AQ 150–170 cps	*H2g*	04652-250	250 g
60:40	MW >10,000,000			*H4g*	18545-250	250 g
30:70	MW 200,000	powder	Viscosity 10% AQ 300–800 cps pH of 1% AQ 9.5	*H5g*	02220-250	250 g

Poly(acrylamide/acrylic acid), potassium salt, crosslinked [31212-13-2] *A2g* . . . . . 24620-250 250 g
Granular "super-absorbant" polymer powder, absorbs many times its weight of water. Active ingredient of low-bulk diapers.

Poly(acrylamide/2-methacryloxyethyltrimethylammonium bromide) [80:20]
[35429-19-7] *A2g* . . . . . 21743-10 10 g
(2g polymer) MW 50,000 TSCA
Cationic acrylamide polymer. Soluble in water.

					Catalog #	Size
Poly(acrylic acid) [9003-01-4] n_D^{25} 1.527 Tg of High MW (>100,000) polymers = 106° TSCA $[-CH_2CH(CO_2H)-]_n$ Important anionic water soluble polymer. Can be crosslinked covalently or ionically to form hydrogels.						
MW ~2K	Viscosity 400–1400 63% AQ	(157.5g polymer)	Mw/Mn 2.4	*H3g*	06513-250	250 g
MW ~5,000	50% soln. in water	(125g polymer)		*H2g*	06519-250	250 g
MW ~30K	30% AQ	mp -4° C		*H4g*	24771-250	250 g
MW ~50K	Viscosity 25% AQ	(62.5g polymer)	Mw/Mn 2.9	*H4g*	00627-250	250 g
MW ~345K	Viscosity 400–1200 cps 25% AQ	(62.5g polymer)	Mw/Mn 6.2	*A2g*	03326-250	250 g
MW ~450K	Viscosity 4 wt% AQ 700 cps	powder		*H4g*	03312-100	100 g
MW ~1M	Viscosity 4% AQ 4K–11K cps	powder		*H4g*	06500-100	100 g
MW ~4M	Viscosity 0.5 wt% AQ 40K–60K cps	powder		*H4g*	06501-100	100 g

Poly(acrylic acid) ammonium salt [28214-57-5] *HK4bcg* . . . . . 03311-25 25 g
MW 250,000 TSCA
Water-soluble anionic polymer. Ammonia is slowly lost from dry polymer.

Poly(acrylic acid) sodium salt [9003-04-7] *A2g*
TSCA $[-CH_2CH(CO_2Na)-]_n$
Water-soluble anionic polymer. Used at low molecular weights as pigment dispersant and at higher molecular weights as a flocculant. Polymer can form complexes with poly(ethylene oxide) and with nucleotides.

MW ~2K	Viscosity of 25% AQ 320 cps	Mw/Mn 2.15	powder	06568-250	250 g
MW ~3K	40% AQ (100g polymer)	Mw/Mn 1.5		18608-250	250 g
MW ~5K	40% AQ (100g polymer)	Mw/Mn <2		18609-250	250 g
MW ~6K	powder	Mw/Mn 2.4		06567-250	250 g
MW ~60K	35% AQ (87.5g polymer)			18611-250	250 g
MW ~225K	20% AQ (50g polymer)	Mw/Mn 6.1		18613-250	250 g

Poly(acrylic acid), sodium salt, crosslinked [09003-04-7] *A2g* . . . . . 24619-250 250 g
Granular "super-absorbant" polymer powder, absorbs many times its weight of water. Active ingredient of low-bulk diapers.

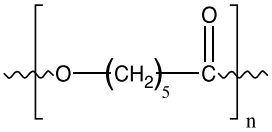
Poly(acryloyl chloride), 25% soln. in dioxane [25189-84-8] *CHM6d* . . . . . 04293-10 10 g
MW ~10,000
Reactive polymer.

Poly(l-alanine) [25191-17-7] *A2g* . . . . . 17028-100 100 mg
MW 3,000–4,000
Low Molecular weight polypeptide useful for controlled release of bioactive substances. Soluble in water, methanol, alkaline water.

Poly(allyl Amine) [30551-89-4] *B4d* . . . . . 24826-100 100 g
MW 15,000
Water soluble cationic polymer with primary amino groups (free base types) for chemical reactions. 15% solid in H_2O.

	Catalog #	Size
New! Poly(allylamine hydrochloride) [71550-12-4] *U5g* MW 120,000–200,000 TSCA $[-CH_2CH(CH_2NH_2xHCl)-]_n$ Polymeric primary amine. 40% AQ solution.	25673-100	100 g
Poly(diallyldimethylammonium chloride) [26062-79-3] MW 240,000 Polydispersity 2–3 TSCA Linear, cationic, aliphatic, quaternary ammonium cyclopolymer. Soluble in H_2O, MeOH, possibly other polar solvents.		
d 1.032 dry powder *KU5g*	17338-10	10 g
d 1.072 28% AQ (70g polymer) Viscosity ~1000 cps; pH (as is) 25° C ~2 *A2g*	19898-250	250 g
Poly(diallyldimethylammoniumchloride) [26062-79-3] *H4g* MW 8,500 Copolymer based on diallyl amine which generates a variety of cyclic tertiary amine structures. Supplied as ammonium salts. 28% solids in water.	24828-100	100 g
Poly(4-aminostyrene) [25086-42-4] *A2g* MW > 150,000 Polymeric aromatic primary amine. Prone to oxidative crosslinking. Insoluble in: organic solvents and mineral acids. Nitrogen content ~11%	02823-1	1 g
Polyaniline, Emeraldine form *A2g* MW ~15,000 d 1.36 Powder Conductive polymer.		
[25233-30-1] Acid doped Conductivity 2^{-4} S/cm Soluble in: sulfonic acid, ME SO_3H	21288-5	5 g
[5612-44-2] Undoped Conductivity 10^{-10} S/cm Soluble in: ME SO_3H, DMF, NMP	24043-5	5 g
Polyaniline, water-soluble *U2g* Reaction product of polyaniline, emeraldine form, with propanesultone.	23614-1	1 g
Poly(λ-benzyl l-glutamate) [25014-27-1] *A2d* MW 30,000–70,000 Tg 15° Liquid crystal polymer. Soluble in dichloroacetic acid.	21444-500 21444-1	500 mg 1 g
Poly(benzyl methacrylate) [25085-83-0] *A2g* n_D^{20} 1.568 Tg 54° $[-CH_2C(CH_3)(CO_2CH_2C_6H_5)-]_n$ Aromatic methacrylate ester polymer.	06562-10	10 g
Poly(4-bromostyrene) [24936-50-3] *U4g* n_D^{20} 1.594 d 1.408 Tg 11° $[-CH_2CH(C_6H_4Br)-]_n$ Polystyrene with reactive bromine substituent.	07030-1	1 g

	Catalog #	Size
Polybutadiene [9003-17-2] *A2g* d .89 TSCA [-$CH_2CH=CHCH_2$-] Liquid polyene that can be cured with sulfur or peroxides. Soluble in hydrocarbons, chloroform, THF.		
MW 1,600 n^{20}_D 1.515 liquid, vinyl-1,2 = 80% Viscosity 40K±10K cps @ 45° C	22395-100	100 g
MW 3,000 n^{20}_D 1.500 liquid, vinyl-1,2 = 80% Viscosity 65K cps @ 45° C	06081-100	100 g
MW 200,000 n^{20}_D 1.518 36% cis, 55% trans and 9% vinyl-1,2	19808-10	10 g
Polybutadiene, hydroxyl terminated *H2g* MW 3,000 Viscosity 20 cps @ 25°C Polydispersity = 1.35 Liquid TSCA HO(-$CH_2CH=CHCH_2$-)$_n$OH Functionalized polydienes which can be used in preparation of block copolymers, polymers with other groups. Hydroxyl value 0.64 meq/g 1,2-vinyl content 65 wt%, 1,4-cis content 12.5 wt% 1,4 trans content 22.5 wt%.	24857-100	100 g
Poly(butadiene/acrylonitrile) 67:33 [9003-18-3] *A3g* n^{20}_D 1.520 d 0.99 TSCA [-$CH_2CH(CN)$-]$_x$(-$CH_2CH=CHCH_2$-)$_y$ Widely used nitrile rubber. Soluble in THF, chloroform, toluene.	06561-500	500 g
Poly(butadiene/acrylonitrile), amine terminated *HU5g* Viscosity 200,000 cps @ 27° C butadiene ~83% acrylonitrile ~17% Mn = 5,500 Amine eq = 0.71 Functionalized poly(butadiene/acrylonitrile) which can be used in preparation of block copolymers, polymers with other end groups.	09753-100	100 g
Poly(butadiene/maleic acid) 1:1 (molar) [28265-35-2] *H2g* (210g Polymer) MW 10,000–15,000 Viscosity 2500 cps (42% soln. in water) Tg 57° TSCA Anionic, water-soluble, polymer capable of reaction through acid groups or backbone unsaturation.	07787-500	500 g
Poly(butadiene/maleic anhydride) 1:1 (molar) [25655-35-0] *CHWX5g* (125g Polymer) MW 10,000–15,000 Viscosity 12 cps (25% soln. in acetone) Tg 70° TSCA Reactive polymer capable of reacting at anhydride or backbone unsaturation.	07788-500	500 g
Poly(1,4-butanediol adipate) [25103-87-1] *A4g* MW 12,000 d 1.019 g/cc Tg -68°C TSCA H[-O$(CH_2)_4O_2C(CH_2)_4$CO-]$_n$$CH_2CH_2CH_2CH_2$OH Aliphatic polyester resin. Soluble in chloroform, THF.	16269-10	10 g
Poly(n-butyl acrylate/2-methacryloxyethyltrimethylammonium bromide) [80:20] [56727-55-0] *A2g* (2g Polymer) Hydrophobic cationic polymer. Soluble in 20% in water.	21744-10	10 g
Poly(iso-butyl acrylate) [26335-74-0] *CH6g* (50g Polymer) mp 81° Tg -24° Tacky, hydrocarbon-soluble polymer.	07034-250	250 g
Poly(n-butyl acrylate) [9003-49-0] *CH6g* (50g Polymer) MW ~10,000 Tg -64° TSCA [-$CH_2CH[CO_2(CH_2)_3CH_3]$-]$_n$ Tacky, hydrocarbon-soluble, low Tg polymer.	03561-250	250 g

	Catalog #	Size
Poly(tert-butyl acrylate) [25232-27-3] *CHX7g* . . . . . mp 200° Tg 43° TSCA (8.75g polymer) Soluble in Hydrocarbon.	18240-25	25 g
Poly(n-butyl acrylate/acrylic acid) [50:50] [25119-83-9] *CH5g* . . . . . TSCA Carboxyl-functional hydrophobic polymer. 20% latex in alcohol (2g polymer) Soluble in alkali.	19911-10	10 g
Poly(iso-butyl methacrylate) fine powder, [η] = 0.60 [9011-15-8] *A2g* . . . . . MW 200,000 n_D^{20} 1.477 d 1.045 Tg 53° TSCA $(-CH_2C(CH_3)[CO_2CH_2CH(CH_3)_2]-)_n$ Firm, water-insensitive, polymer.	02452-500	500 g
Poly(n-butyl methacrylate) [9003-63-8] MW ~180,000 n_D^{20} 1.483 d 1.06 TSCA $[-CH_2C(CH_3)[CO_2(CH_2)_3CH_3]-]_n$ Firm, water-insensitive, polymer. Soluble in acetone, chloroform, IPA, MEK, THF, toluene.		
Fine powder, [η] = 0.50 Tg 20° *A2g*	02061-100	100 g
40% Solution in mineral spirits *EH7g*	19900-250	250 g
Polycaprolactam [25038-54-4] *A2g* (Nylon 6) mp 215–250° n_D^{20} 1.530 TSCA Widely used in fibers.		
MW ~18,000	18180-250	250 g
MW 35,000 4.1 rel. visc.	18179-250	250 g
Polycaprolactone [24980-41-4] . . . . . MW 43,000 – 50,000 mp 55–65° C ~3mm pellets TSCA $[-O(CH_2)_5CO-]_n$ Biodegradable polymer, hydroxyl end group. 	19561-100 19561-500	100 g 500 g
Polycaprolactone diol [36890-68-3] *H4g* d 1.07 TSCA $H[-O(CH_2)_5CO-]_nOCH_2CH_2OCH_2CH_2O[-CO(CH_2)_5O-]_nH$ Biodegradable polymer. Can be used to make block copolymers.		
MW 1,250 mp 45° C liquid Viscosity 65–100 cps @ 55° C	09706-500	500 g
	09706-2.5	2.5 kg
MW 2,000 mp 50° C liquid Viscosity 530–730 cps @ 55° C	09694-500	500 g
Polycaprolactone, powdered [24980-41-4] *H4g* . . . . . MW 50,000 mp 58–60° C TSCA $[-O(CH_2)_5CO-]_n$ Biodegradable polymer, hydroxyl end group.	25090-500 25090-100	500 g 100 g

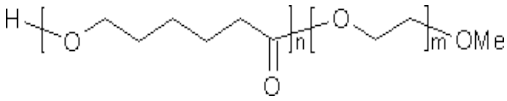
Poly(ε-caprolactone)-block-poly(ethylene glycol) *AK2bf*

Among the leading candidates for biodegradation are caprolactone based materials due to their approved uses by the FDA for drug delivery systems, sutures, long term implants and adhesion barriers as well as new tissue scaffold host systems.

Caprolactone is a biodegradable polyester with a relatively low melting point (60° C) but a glass transition temperature (Tg) around -60° C. The high crystallinity in the polyester accounts for this property balance. It is made by metal catalyzed ring opening polymerization of epsilon caprolactone. A typical molecular weight of standard polycaprolactone homopolymer is 188k Daltons. By comparison, a 100% polylactic acid homopolymer with Mw 330k Daltons has a (Tg) temperature of +55° C and a melting temperature Tm of about 175° C.

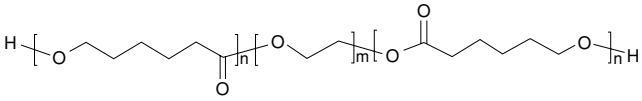
Further modifications of polycaprolactone are possible by converting it into diblock (A-B) or triblock (A-B-A) copolymers with polyethylene glycol. Synthetic methods which lead to block structures allow the polymer to have controlled biodegradation rates as well as improved physiological compatibility characteristics. Additional custom synthesis materials are available upon request. Please contact us for a quotation for your custom synthesis needs. For Poly(ethylene glycol) / Poly(lactic acid) Diblock & Triblock Polymers, see page 291.

Numbers in parenthesis refer to the MW of the segment



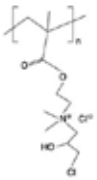
Diblock Polymers

	Catalog #	Size
PCL(1,000)-b-PEG(1,000)	25010-0.5	0.5 g
	25010-1	1 g
PCL(1,000)-b-PEG(2,000)	25011-0.5	0.5 g
	25011-1	1 g
PCL(1,000)-b-PEG(5,000)	25012-0.5	0.5 g
	25012-1	1 g
PCL(5,000)-b-PEG(1,000)	25022-0.5	0.5 g
	25022-1	1 g
PCL(5,000)-b-PEG(2,000)	25023-0.5	0.5 g
	25023-1	1 g
PCL(5,000)-b-PEG(5,000)	25024-0.5	0.5 g
	25024-1	1 g



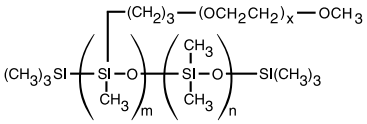
Triblock Polymers *AK2bf*

PCL(1,000)-b-PEG(1,000)-b-PCL(1,000)	25019-1	1 g
	25019-0.5	0.5 g
PCL(1,000)-b-PEG(2,000)-b-PCL(1,000)	25020-1	1 g
	25020-0.5	0.5 g
PCL(1,000)-b-PEG(6,000)-b-PCL(1,000)	25021-1	1 g
	25021-0.5	0.5 g
PCL(1,000)-b-PEG(10,000)-b-PCL(1,000)	25013-0.5	0.5 g
	25013-1	1 g
PCL(5,000)-b-PEG(1,000)-b-PCL(5,000)	25014-1	1 g
	25014-0.5	0.5 g
PCL(5,000)-b-PEG(2,000)-b-PCL(5,000)	25015-1	1 g
	25015-0.5	0.5 g
PCL(5,000)-b-PEG(5,000)-b-PCL(5,000)	25016-1	1 g
	25016-0.5	0.5 g
PCL(5,000)-b-PEG(10,000)-b-PCL(5,000)	25025-1	1 g
	25025-0.5	0.5 g

	Catalog #	Size
Poly(2-chloro-1,3-butadiene) [9010-98-4] *A2g* (Neoprene®) d 1.23 Viscosity 34–41 @ 100° C Tg -48° TSCA $[-CH_2CH=C(Cl)CH_2-]_n$ Widely used rubber for applications requiring good solvent resistance.	21289-100	100 g
Poly(3-chloro-2-hydroxypropyl-2-methacryloxyethyldimethylammonium chloride), 20% soln. in water [76123-64-3] *U7g* (2g Polymer) Reactive quaternary ammonium polymer. Chlorohydroxypropyl group can be cyclized to oxirane by mild alkali. 	21480-10	10 g
Poly(4-chlorostyrene) [24991-47-7] *A2g* MW 250,000 Tg 110° $[-CH_2CH(C_6H_4Cl)-]_n$ Substituted polystyrene, can be converted to other substituted polystyrenes.	07041-5	5 g
Poly(chlorotrifluroethylene) [9002-83-9] *A2g* MW 500–600 Viscosity 12 cps @ 37° C Tg -40°, 52° (static method), Tg 100° (mechanical method) TSCA $[-CF_2CF(Cl)-]_n$ Inert liquid for high temperature baths.	15176-100	100 g
Poly(n-decyl acrylate) [29500-86-5] *CHX7g* (10g Polymer) MW ~130,000 TSCA Soft, tacky, hydrophobic polymer.	07042-50	50 g
New! Poly(2-dimethylaminoethyl methacrylate), 28% soln. in toluene *CH6g* MW 200,000 liquid Water soluble, cationic polymer.	25996-10	10 g
Poly(2,6-dimethyl-1,4-phenylene oxide) [25134-01-4] *A2g* MW 50,000 Mn 20,000 n_D^{20} 1.575 d 1.06 Tg 209° TSCA $[-C_6H_2(CH_3)_2O-]_n$ High softening point (90°), polydispersity ~2.5. Soluble in toluene, chloroform, chlorobenzene.	08794-100	100 g
Poly(dimethylsiloxane), methyl terminated [63148-62-9] *A2g* n_D^{20} 1.430 Tg -127° TSCA $[-Si(CH_3)_2O-]_n$ Inert hydrophobic liquids.		
MW 3,900 Viscosity 50 centistokes	09776-250	250 g
MW 6,000 Viscosity 100 centistokes	02274-250	250 g
MW 17,000 Viscosity 500 centistokes	03496-250	250 g

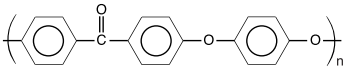
	Catalog #	Size

Poly(dimethylsiloxane ethylene oxide), methyl terminated [68937-54-2] *EH4g*
d 1.07 TSCA
Surfactant-like diblock copolymers.

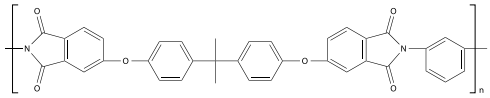


[25:75]	MW 600	n_D^{20} 1.442	Viscosity 20 cps		09780-100	100 g
[20:80]	MW 3,000	n_D^{20} 1.454	Viscosity 80–150 cps	liquid	21870-100	100 g

Poly ether ether ketone (PEEK) [29658-26-2] *A2g* . . . . . 23969-50 50 g
mp 340° d 1.30 Tg 140° TSCA
High temperature resistant polymer. Granules are dusted with a nominal 0.01% Calcium Stearate as a processing lubricant.



Polyetherimide [61128-46-9] *A4g* . . . . . 16845-100 100 g
MW 30,000 Mn = 17,000 d 1.27 Tg 217° TSCA
High softening point (~200°) resin.
Soluble in dichloromethane.



Poly(ethyl acrylate) [9003-32-1] *CH7g* . . . . . 17342-2 2 g
MW ~70,000 n_D^{20} 1.469 Tg -23° TSCA
$[-CH_2CH(CO_2C_2H_5)-]_n$
Low Tg acrylic ester polymer.

Poly(ethyl acrylate/acrylic acid), [50:50] [25085-35-2]
TSCA
Alkali-soluble or alkali-swellable acrylic random polymers.

20% soln. in ethanol (2g polymer)	*CH4g*	19914-10	10 g
Flakes	*A2g*	21056-5	5 g

Poly(ethylene/acrylic acid) [92:8] [9010-77-9] *A2g* . . . . . 06517-100 100 g
mp 100° C d 0.932 TSCA
$(-CH_2CH_2-)_x[-CH_2CH(CO_2H)-]_y$
Modified polyethylene resin. Improved adhesion. Can be converted into ionomers. Random copolymer. Soluble in ternary solvents like perchloroethylene, IPA and toluene.

Polyethylene [9002-88-4] *A2g*
TSCA
$[-CH_2CH_2-]_n$
Hydrophobic, easily processed or fabricated, resin. Soluble in xylene, tetralin, TCE @ 50-60°
Mw/Mn = 1.10.

MW 2K	mp 124°	n_D^{20} 1.545	d .97	Tg–125° lumps	07652-100	100 g
MW 135K	mp 140°	n_D^{20} 1.510	d .915	20μ powder chromatographic (reversed phase HPLC) grade	15184-100	100 g

				Catalog #	Size
Polyethylene, chlorinated, 25% Cl [64754-90-1] *A2g* . . . . . TSCA $H(OCH_2CH_2)_n OH$ Useful as primer or coating resin due to good adhesion properties. Randomly chlorinated HDPE.				01814-100	100 g
Poly(3,4-ethylenedioxythiophene)/poly(styrenesulfonate), aqueous dispersion (PEDT/PSS) [155090-83-8] *U5g* . . . . . Surface resistivity 730 KOhm/sq. Solid content 1.24%, sodium 280 ppm. Conductive polymer.				24215-100	100 g
Poly(ethylene glycol) [25322-68-3] *H3g* n^{20}_D 1.4563 Tg -41° TSCA $H(OCH_2CH_2)_nOH$ Water-soluble, nonionic, relatively inert, liquids or solids. Confers slip and humectant properties to coatings.The terms poly(ethylene glycol) and poly(ethylene oxide) refer to polymers which are chemically identical. Polymer chains are hydroxyl-terminated at both ends. At all except the lowest moleclarweights poly(ethylene glycol) has a broad molecular weight distribution ranging from ~0.5x to 1.5x the values shown.Molecular Weight (MW) is approximate. *For higher molecular weights, see Poly(ethylene oxide), page 292.* Soluble in alcohol, acetone, chloroform, toluene, dichloromethane.					
MW 200	viscous liquid		Viscosity 4.3 cps @ 100° C	01112-250	250 g
MW 200	Mw/Mn 1.05g			15644-1	1 g
MW 300	viscous liquid	mp -15 to -8	Viscosity 5.8 cps @ 100° C	01110-250	250 g
MW 400	viscous liquid	mp 4–8	Viscosity 7.3 cps @ 100° C	01109-250	250 g
MW 600	viscous liquid	mp 20–25	Viscosity 10.5 cps @ 100° C	00684-250	250 g
MW 1,000	waxy solid	mp 37–40	Viscosity 17.4 cps @ 100° C	00682-250	250 g
MW 1,450	waxy solid	mp 43–46	Viscosity 25–32 cps @ 100° C	00679-250	250 g
MW 2,000	flakes	mp 68	Viscosity 38–49 cps @ 100° C	25360-250	250 g
MW 3,400	waxy solid, pharma grade	mp 54–58	Viscosity 75–110 cps @ 100° C	06102-250	250 g
MW 7,500	waxy solid	mp 60–63	Viscosity 700–900 cps @ 100° C	06103-250	250 g
MW 10–16K	hard solid	mp 129		22567-250	250 g
MW 20,000	hard solid	mp 61–64		22568-250	250 g
MW 1,540	waxy solid, pharma. grade	mp 43–46	Viscosity 25–32 cps @ 100° C	01102-100	100 g
MW 8,000	waxy solid, pharma. grade	mp 60–63	Viscosity 700–900 cps @ 100° C	17243-100	100 g
Poly(ethylene glycol) (200) adipate [68647-16-5] *A2g* . . . . . MW 530 TSCA $H(OCH_2CH_2)_nO_2C(CH_2)_4CO(OCH_2CH_2)_nOH$ Water-soluble, biodegradable, polymer. Reaction product of one molecule of adipic acid and two molecules of PEG 200.				21509-100	100 g
Poly(ethylene glycol) bis (2-aminoethyl) [26062-79-3] *U5g* Polydispersity 2 – 3 TSCA A bifunctional Poly(ethylene glycol) derivative that can be used to conjugate proteins and drug substances for targeted drug delivery studies. Soluble in H_2O, MeOH, possibly other polar solvents.					
[MW ~1,000]				24285-1	1 g
[MW 10,000]				24303-1	1 g

	Catalog #	Size
Poly(ethylene glycol) α-2-aminoethyl, μ-methoxy [80506-64-5] *H4g*	24304-1	1 g

MW 2,000 solid
Mono amino poly(ethylene glycol) for protein conjugation.

Poly(ethylene glycol)-bisphenol A diglycidyl ether adduct [37225-26-6] *H6g*	04686-250	250 g

MW 18,500 hard solid TSCA
$(CH_3)_2C[C_6H_4\text{-}H\text{-}[OCH_2CH(OH)CH_2(OCH_2CH_2)_nOH]]_2$
Polymer contains more hydroxyl groups (4 or more) than poly(ethylene glycol).

Poly(ethylene glycol) (n) diacrylate [26570-48-9] *HO5g*
TSCA
$H_2C{=}CHCO(OCH_2CH_2)_nO_2CCH{=}CH_2$
Long-chain, hydrophilic, crosslinking monomers. (n) value is MW of PEG unit.

MW 200	n_D^{20} 1.464	750ppm MEHQ	d 1.122	Viscosity 25 cps @ 25°	00669-250	250 g
MW 400	n_D^{20} 1.465	500ppm MEHQ	d 1.117	Viscosity 57 cps @ 25°	01871-250	250 g
MW 4,000	mp 56–60°				15246-1	1 g

Poly(ethylene glycol) (n) diglycidyl ether [72207-80-8] *H4g*
TSCA
Crosslinker for amine-, hydroxyl-, and carboxyl-functional polymers. (n) value is MW of PEG unit.

MW 200	WPE ~195	08209-100	100 g
MW 400	WPE ~280	08210-100	100 g
MW 600	WPE ~400	08211-100	100 g
MW 1,000	WPE ~600	24047-100	100 g

Poly(ethylene glycol) (n) dimethacrylate [25852-47-5] *H5g*
TSCA
$H_2C{=}C(CH_3)CO(OCH_2CH_2)_nO_2CC(CH_3){=}CH_2$
Long-chain hydrophilic, crosslinking monomers. (n) value is MW of PEG unit.

MW 200	75 ppm HQ	n_D^{20} 1.460	d 1.08	Viscosity 15 cps @ 25° C	00096-100	100 g
MW 400	245 ppm MEHQ	Tg -21°	d 1.117	Viscosity 85 cps @ 25° C	15179-100	100 g
MW 600	1,000 ppm MEHQ		d 1.101	Viscosity 67 cps @ 25° C	02364-100	100 g
MW 1,000	90 ppm MEHQ & 250 ppm BHT		d 1.1	Viscosity 76 cps @ 40° C	15178-100	100 g
MW 8,000	mp 54–57° C	White solid			25428-2	2 g
MW ~20,000	bp >250° C	White Solid			25406-5	5 g

Poly(ethylene glycol) (n) dimethyl ether [24991-55-7]
n_D^{20} 1.455
$CH_3COCH_2(H_2)_nOCH_3$
Metal complexing and phase-transfer agents. (n) value is MW of PEG unit

MW ~500		d. 1.05 g/mL @ 25° C	25405-25	25 g
MW 1,000	mp 36–40°	d 1.10	17032-25	25 g
MW 2,000	mp 52–55°		17033-25	25 g

					Catalog #	Size
Poly(ethylene glycol) (n) distearate [9005-08-7] *A2g* TSCA $CH_3(CH_2)_{16}CO(OCH_2CH_2)_nO_2C(CH_2)_{16}CH_3$ Waxy, water dispersible solid. n = value is MW of PEG unit. Soluble in IPA, hot water, mineral oil.						
MW 200	mp 32–36°				02298-100	100 g
					02298-500	500 g
MW 400	mp 35–37°				01048-100	100 g
					01048-500	500 g
MW 6,000	mp 52–57°				19234-100	100 g
Poly(ethylene glycol) (750) monocarboxymethyl ether monomethyl ether [67665-18-3] *U4g* . . Carboxylic acid-terminated poly(ethylene glycol). Can be coupled to molecules of biomedical interest using carbodiimides.					21483-500	500 mg
Poly(ethylene glycol) (n) monomethacrylate [25736-86-1] *H5ad* TSCA $H_2C{=}C(CH_3)CO(OCH_2CH_2)_nOH$ Long-chain hydrophilic macromonomers. Used to introduce hydrophilic sites into polymers, to stabilize emulsion polymers, and to prepare comb polymers. (n) value is MW of PEG unit.						
MW 200	n^{20}_D 1.105	up to 700 ppm MEHQ inhibitor			16712-100	100 g
MW 400	n^{20}_D 1.114	800 -1,000 ppm MEHQ inhibitor			16713-100	100 g
Poly(ethylene glycol) monomethyl ether [9004-74-4] *A2g* TSCA $CH_3(OCH_2CH_2)_nOH$ Neutral, water-soluble, polymers with hydroxyl group at one end only.						
MW 350	mp -8°	n^{25}_D 1.4555	d 1.091	Viscosity 4.1 cps @ 100° C	04200-500	500 g
MW 550	mp 20°	n^{25}_D 1.455	d 1.091	Viscosity 7.5 cps @ 100° C	04457-500	500 g
MW 750	mp 30°	n^{25}_D 1.459	d 1.082	Viscosity 10.3 cps @ 100° C	00626-500	500 g
MW 1,900	mp 52°		d 1.102	Viscosity 63 cps @ 100° C	04242-500	500 g
MW 5,000	mp 59°		d 1.106	Viscosity 613 cps @ 100° C	05986-500	500 g
Poly(ethylene glycol) (n) monomethyl ether monomethacrylate [26915-72-0] *BHJO6d* TSCA $H_2C{=}C(CH_3)CO_2(CH_2CH_2O)_nCH_3$ Hydrophilic monomer used to introduce hydrophilic sites into polymers, to stabilize polymer emulsions and synthesis of comb polymers. (n) value is MW of PEG unit.						
MW 200	n^{25}_D 1.449		100 ppm MEHQ and 300 ppm BHT inhibitor		16664-100	100 g
					16664-500	500 g
MW 400	n^{25}_D 1.457	Tg -62°	100 ppm MEHQ and 200 ppm BHT inhibitor		16665-100	100 g
					16665-500	500 g
MW 1000	n^{25}_D 1.46	Tg -40°	100 ppm MEHQ and 300 ppm BHT inhibitor		16666-100	100 g
					16666-500	500 g

	Catalog #	Size
Poly(ethylene glycol) (n) monomethyl ether, mono(succinimidyl succinate) ester *U5g* Reactive poly(ethylene glycol). Used to attach PEG chains to organic molecules, especially those of biomedical interest. (n) value is MW of PEG unit.		
MW 1,900	21482-500	500 mg
MW 5,000	18000-500	500 mg
Poly(ethylene glycol) (200) mono-stearate [9004-99-3] *A3g* . . . . . . TSCA Poly(ethylene glycol) having a hydrophobic chain end used as nonionic surfactant.	03142-100	100 g

Poly(ethylene glycol) / Poly(lactic acid) Diblock and Triblock Polymers (PEG/PLA)
Polymer structures featuring polyethylene glycol (PEG), with biodegradable or biocompatible segments offering micellular, nano and microsphere morphologies which are useful for controlled release formulations. Molecular weights of blocks controlled by GPC. Alternative structures can be synthesized.

Historically there have been three basic building block monomers for degradable polymers: lactides, glycolides and caprolactone. All are in clinical use and show varying degrees of degradability based on backbone compositions, crystallinity and molecular weights.

Lactic acid is a "chiral" molecule having both (L) and (D) forms with (L) being the common metabolite. The family of lactic acid polymers includes the pure poly-L- lactic acid (L form of PLA), the pure poly-D-lactic acid and the poly-D,L-lactic acid (DL-PLA). Many other useful compositions occur when the polymer is organized into diblocks with ethylene glycol and/or glycolic acid comonomers or triblocks with ethylene glycol and/or glycolic acid. (Numbers in parenthesis refer to the MW of the segment) For Poly(ε-caprolactone)-block-poly(ethylene glycol) Diblock & Triblock Polymers, see page 285.

Diblock Polymers *AK2bf*

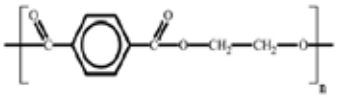
PEG(350)-b-PLA(300)	24375-0.5	0.5 g
	24375-1	1 g
PEG(1000)-b-PLA(750)	24378-0.5	0.5 g
	24378-1	1 g
PEG(1000)-b-PLA(5000)	24381-0.5	0.5 g
	24381-1	1 g
PEG(5000)-b-PLA(1000)	24386-0.5	0.5 g
	24386-1	1 g
PEG(5000)-b-PLA(5000)	24389-0.5	0.5 g
	24389-1	1 g
PEG(5000)-b-PLA(10,000)	25018-0.5	0.5 g
	25018-1	1 g
PEG(10,000)-b-PLA(5,000)	25017-0.5	0.5 g
	25017-1	1 g

	Catalog #	Size
Triblock Polymers *HU4bg*		
PLA(1000)-b-PEG(1000)-b-PLA(1000)	24500-0.5	0.5 g
	24500-1	1 g
PLA(2000)-b-PEG(1000)-b-PLA(2000)	24501-0.5	0.5 g
	24501-1	1 g
PLA(5000)-b-PEG(1000)-b-PLA(5000)	24502-0.5	0.5 g
	24502-1	1 g
PLA(1000)-b-PEG(4000)-b-PLA(1000)	24503-0.5	0.5 g
	24503-1	1 g
PLA(1000)-b-PEG(10,000)-b-PLA(1000)	24509-0.5	0.5 g
	24509-1	1 g
PLA(5,000)-b-PEG(10,000)-b-PLA(5,000)	25026-0.5	0.5 g
	25026-1	1 g
PLA(10,000)-b-PEG(10,000)-b-PLA(10,000)	25027-0.5	0.5 g
	25027-1	1 g

Poly(ethylene glycol terephthalate) [25038-59-9] *H2g* . . . . . 04301-250 500 g

TSCA $(C_{10}H_8O_4)_n$

Polymer widely used in films, fibers, and drink bottles. Low gas permeability.



Poly(ethylene oxide) [25322-68-3] *H2g*

White, free flowing powder TSCA $(-CH_2CH_2O-)_n$

Water-soluble polymer used to impart viscosity to and modify flow of aqueous solutions. Poly(ethylene oxide) has a broad molecular weight distribution ranging from ~0.5x to 1.5x the values shown. *For lower molecular weights, see Poly(ethylene glycol), page 288.* Soluble in acetone, alcohol, chloroform, toluene, dichloromethane.

MW 100,000	Viscosity 5% AQ 30–50 cps	06104-500	500 g
MW 200,000	Viscosity 5% AQ 65–115 cps	17503-500	500 g
MW 300,000	Viscosity 5% AQ 600–1,200 cps	06105-500	500 g
MW 600,000	Viscosity 5% AQ 4,500–6,800 cps	06106-500	500 g
MW 1,000,000	Viscosity 2% AQ 400–800 cps	21295-500	500 g
MW 4,000,000	Viscosity 1% AQ 1,650–5,500 cps	04030-500	500 g
MW 5,000,000	Viscosity 1% AQ 5,500–7,500 cps	04031-500	500 g
MW 8,000,000	Viscosity 1% AQ 10,000–15,000 cps	21296-500	500 g

						Catalog #	Size

Poly(ethylene oxide-b-propylene oxide) [9003-11-6] *H4g*
TSCA $H(-OCH_2CH_2-)_x[-OCH(CH_3)CH_2-]_y(-OCH_2CH_2-)_2OH$
Water-soluble or water-dispersible polymers with surfactant properties. Chains are hydroxyl terminated. Polymers are p(EO/PO/EO) triblocks.

[0.15:1]	liquid	MW 1,100	n^{20}_D 1.4515	d 1.02	Viscosity 165 cps @ 100° C	16273-100	100 g
[0.8:1]	liquid	MW 2,900	n^{20}_D 1.4575	d 1.05	Viscosity 550 cps @ 100° C	16275-100	100 g
[0.33:1]	liquid	MW 3,400	n^{20}_D 1.4547	d 1.03	Viscosity 700 cps @ 100° C	16274-100	100 g
[5:1]	waxy solid	MW 8,750		d 1.06	Viscosity 1000 cps @ 100° C	16277-100	100 g
[3:1]	waxy solid	MW 13,300		d 1.02	Viscosity 3100 cps @ 100° C	16276-100	100 g

Polyethylene-co-vinyl acetate 70:30 (wt) [24937-78-8]
A highly biocompatible polymer used in a wide variety of biomedical device applications including drug delivery systems and medical implants. PEVA has many desirable characteristics (tensile strength, barrier properties, controlled release and optical transparency). Our PEVA is a highly purified copolymer with no processing additives and a low polydispersity index. PEVA can be processed in a large number of ways including spin coating, casting, molding, extrusion and a variety of emulsion and solution mixing. Polysciences Inc. can synthesize custom ethylene:vinyl acetate ratios and molecular weights, please use our custom inquiry form for more information.

For information on using PEVA in medical devices please see the following references: Hsieh, D. S. T., Rhine, W. D. and Langer, R. (1983), Zero-order controlled-release polymer matrices for micro- and macromolecules. Journal of Pharmaceutical Sciences, 72: 17–22. Tallury, P. et al. (2007), Poly(ethylene-co-vinyl acetate) copolymer matrix for delivery of chlorhexidine and acyclovir drugs for use in the oral environment: Effect of drug combination, copolymer composition and coating on the drug release rate. Dental materials, 23: Issue 4, 404-409.

MW 55,000	25356-25	25 g
MW 60,000	25357-25	25 g
MW 65,000	25358-25	25 g
MW 75,000	25359-25	25 g

Poly(ethylene/vinyl acetate) [24937-78-8] *A2g*
TSCA $(-CH_2CH_2-)_x[-CH_2CH(O_2CCH_3)-]_y$
Used as a hot-melt adhesive, wax additive, and precursor to poly(ethylene/vinyl alcohol) resins. Soluble in toluene, xylene, TCE, THF, MEK, n-butanol.

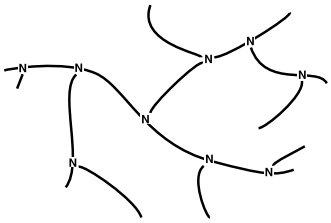
60:40 (wt)	mp 104°	d .964	Antioxidant 540 ppm BHT	06107-500	500 g
72:28 (wt)	mp 127°	d 0.95	~500 ppm BHT	06108-500	500 g

Poly(ethylene/vinyl alcohol) [25067-34-9] *A2g*
TSCA $(-CH^2CH^2-)x[-CH^2CH(OH)-]y$
Polymer containing both hydrophilic and hydrophobic segments. Could be used to prepare other ethylene copolymers. Used in packaging films. Soluble in DMF, DMSO, n-propanol.

85:15 (wt)				18099-100	100 g
74:26 (wt)				18100-100	100 g
44:56 (wt)	d 1.14	Tg 61°	mp 164°	17402-100	100 g
32:68 (wt)	d 1.19	Tg 69°	mp 181°	17403-100	100 g

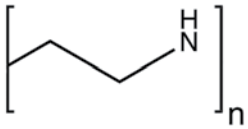
Poly(ethylene/maleic anhydride) 1:1 (molar) [9006-26-2] *H3g* . . . . . 02308-50 50 g
MW 400,000 Viscosity 2% 5cps TSCA
Reactive with alcohols, amines. Hydrolyzes in water to a water-soluble anionic polymer.

Polyethylenimine, branched [9002-98-6] *H6g*
d 1.029-1.038 TSCA
$(\text{-}NHCH_2CH_2\text{-})_x[\text{-}N(CH_2CH_2NH_2)CH_2CH_2\text{-}]_y$
Highly branched polyamine with high charge density. Liquid polymers. Soluble in water at all molecular weights, also soluble in lower alcohols, glycols, and THF. Polymers contain primary, secondary, and tertiary amine groups in approximately 25/50/25 ratio. See poly(2-ethyl-2-oxazoline) for precursors to linear polyethylenimine. Soluble in Water at all molecular weights, lower alcohols, glycols and THF.



				Catalog #	Size
99% soln. in water	MW 600	Viscosity 500–2500 cps	Polydisperity 1.08	02371-100	100 g
				02371-500	500 g
99% soln. in water	MW 1,200	Viscosity 3500–7500 cps	Polydisperity 1.08	06088-100	100 g
				06088-500	500 g
99% soln. in water	MW 1,800	Viscosity 8500–15,000 cps	Polydisperity 1.14	06089-100	100 g
				06089-500	500 g
99% soln. in water	MW 10,000	Viscosity >10,000 cps		19850-100	100 g
				19850-500	500 g
30% soln. in water	MW 10,000	Viscosity 100–200 cps		17938-100	100 g
30% soln. in water	MW 70,000	Viscosity 400–900 cps	Polydisperity 17±5.2	00618-100	100 g
				00618-500	500 g
30% soln. in water	MW 50K–100K	Viscosity 900–1500 cps		06090-100	100 g
				06090-500	500 g
50% soln. in water	MW 750,000	Viscosity 27,000 cps @ 20° C		25448-100	100 g
				25448-500	500 g
33% soln. in water	MW 750,000	Viscosity 1,400 cps @ 20° C		25449-100	100 g
				25449-500	500 g
25% soln. in water	MW 2,000,000	Viscosity 500–1,000 cps @ 20° C		25450-100	100 g
				25450-500	500 g

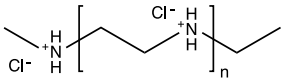
Polyethylenimine, Linear [9002-98-6] *HU4g*
powder TSCA
$(C_2H_5N)_x$
Linear polyethylenimines (PEIs) contain all secondary amines, in contrast to branched PEIs which contain primary, secondary and tertiary amino groups. The linear PEIs are solids at room temperature where branched PEIs are liquids at all molecular weights. Soluble in hot water, cold water at low pH, methanol, and ethanol. Insouble in bezene, ethyl ether, acetone, and cold water.
Contains up to 7-8% of poly(ethyl-2-oxazoline)



MW 2,500	mp 73–79°	24313-2	2 g
MW 25,000	mp 73–75°	23966-2	2 g
MW 100,000	mp 73–75°	25414-2	2 g
MW 250,000	mp ~72°	24314-2	2 g

	Catalog #	Size

Polyethylenimine "Max" – High Potency Linear PEI
A nearly fully hydrolyzed linear polyethylenimine with longer contiguous ethyleneimine segments. Although N-deacylation reactions are notoriously difficult, our new linear polyethylenimine material is believed to contain more than 11% additional free (protonatable) nitrogens than our standard linear polyethylenimine material. Easy to handle hydrochloride salt form. Insoluble in common organic solvents (ethanol, acetone, tetrahydrofuran) Soluble in: cold and room temperature water.



Polyethylenimine "Max", (MW 4,000) High Potency Linear PEI [9002-98-6] *H6g* . . . . . 24885-2 2 g
MW ~2,500 (free base form) White to off-white free flowing solid TSCA
Nominal 4,000 Mw in hydrochloride salt form. Comparable to *(Cat. #24313)* – Polyethylenimine, Linear, Mw 2,500 which is not in the hydrochloride salt form.

Polyethylenimine "Max", (MW 40,000) High Potency Linear PEI [9002-98-6] *H6g* . . . . . 24765-2 2 g
White to off-white free flowing solid TSCA
Molecular Weight: 25,000 Mw in free base form. Nominal 40,000 Mw in hydrochloride salt form. Comparable to *(Cat. #23966)* Polyethylenimine, Linear, Mw 25,000, which is not in the hydrochloride salt form. Soluble in Cold and room temperature water Insoluble in: Common organic solvents (ethanol, acetone, tetrahydrofuran).

Polyethylenimine "Max", (MW 160,000) High Potency Linear PEI *H6g* . . . . . 25439-2 2 g
MW 100,000 TSCA
Molecular Weight (Mw): Mw in free base form. Nominal 160,000 Mw in hydrochloride salt form. Comparable to *(Cat. #25414)* Polyethylenimine, Linear, Mw 100,000 which is not in the hydrochloride salt form. Soluble in Cold, room temperature water.

Polyethylenimine, branched, permethylated, permethobromide [28728-59-8] *U2g* . . . 21903-10 10 g
(1g polymer) MW ~6,300 (prepared from PEI MW 1,800)
Highly branched, high charge density, quaternary ammonium polymer.

Poly(2-ethyl-2-oxazoline) [25805-17-8] *A2g*
n_D^{20} 1.520 d 1.14 Tg 70° TSCA
$[-N(COC_2H_5)CH_2CH_2-]_n$
Neutral, water soluble, polymer. Also soluble in DMF, lower alcohols, methyl ethyl ketone and methylene chloride. Can be hydrolyzed to linear polyethylenimine.

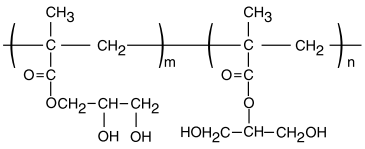
MW 5,000	Viscosity 100% AQ @ 30° = 2.1 CST		24066-50	50 g
MW 50,000	Viscosity 10% AQ @ 30° = 6.2 CST	Polydispersity ~1.9	17808-100	100 g
MW 200,000	Viscosity 10% AQ @ 30° = 18-24 CST	Polydispersity ~3.4	24882-100	100 g
MW 500,000	Viscosity 10% AQ @ 30° = 72.3 CST	Polydispersity ~3.4	17810-100	100 g

Poly(furfuryl alcohol) [25212-86-6] *H6g* . . . . . 15794-100 100 g
n_D^{20} 1.36 Viscosity 14,500±2500 cps TSCA
Dark, viscous, fluid with double bonds in the polymer backbone. Soluble in acetone, alcohol, esters, toluene.

Poly(1-glycerol methacrylate) [28474-30-8] *U5g* . . . . . 16855-10 10 g
TSCA
Hydrophilic, water-swellable, polymer. Probably cross-linked.

	Catalog #	Size
Poly(1-glycerol methacrylate) [28474-30-8] *U5g*	16855-10	10 g

TSCA
Hydrophilic, water-swellable, polymer.
Probably cross-linked.



Poly(glycidyl methacrylate), 10% soln. in MEK [25067-05-4] *CH5g*	06524-5	5 g

(0.5g polymer) MW ~25,000 Tg 46° TSCA
Reacts with carboxyl, hydroxyl, and amine groups and can be used to immobilize biomolecules.

Poly(glycolic acid) [i.v. 1.0-2.0] [26124-68-5] *AK2be*	06525-5	5 g
	06525-25	25 g

MW >100,000 Tg 36° TSCA
$H(OCH_2CO)_nOH$
Biodegradable polymer. Decomposes in 6 months at 37° at pH 9.0. Soluble in HFIP, HFA-sesquihydrate.

Poly(hexamethyleneadipamide) [32131-17-2] *A2g*	06557-500	500 g

(Nylon 6/6) mp 265–70° n_D^{20} 1.530 d 1.22–1.25 Tg 45° TSCA
$[-NH(CH_2)_6NHCO(CH_2)_4CO-]_n$
Polymer used in fibers. Soluble in cresols, formic acid, sulfuric acid.

Poly(hexamethylenesebacamide) [9008-66-6] *A2g*	06558-500	500 g

(Nylon 6/10) mp 216°–233° n_D^{20} 1.530 Tg 40°
$[-NH(CH_2)_6NHCO(CH_2)_8CO-]_n$
Polymer used in fibers. Soluble in cresols, formic acid, sulfuric acid.

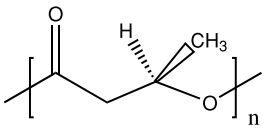
Poly(hexyl isocyanate) [26746-07-6] *U2g*	19249-1	1 g

MW ~80,000 Viscosity i.v. ~1 Liquid crystal polymer

Poly(4-hydroxybenzoic acid) [26099-71-8] *HU4g*	04306-25	25 g

MW 12,000–16,000 mp >320° Size: 40–60µm
High-melting polymer, insoluble in organic solvents. Soluble in hot sulfuric acid, hot sodium hydroxide.

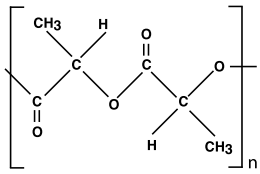
Poly[(R)-3-hydroxybutyrate] [26063-00-3] *A2g*
White or faintly beige powder $[-COCH_2CH(CH_3)O-]_n$
Polyhydroxybutyrates (PHBs) are the most common type of polyhydroxyalkanoates (PHAs) and were first discovered in prokaryotes as a high molecular weight storage molecule in cytoplasmic granules. There has been interest in the use of PHBs and PHB copolymers in the biodegradable plastics industry. The biodegradable and non-toxic effect of PHBs also make them a strong possibility for many medical applications, including drug release, bone regeneration, and nerve guidance. Purity 99.5%



~500	16930-1	1 g
~1,000	16932-1	1 g
~2,000	16934-1	1 g
~3,000	16936-1	1 g
~5,000	16938-1	1 g
~10,000	16940-1	1 g

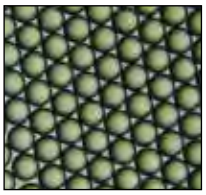
	Catalog #	Size
Poly[(-)3-hydroxybutyric acid] [26063-00-3] *A2g* MW ~500,000 mp 168–176° Tg 15° $[-COCH_2CH(CH_3)O-]_n$ Biodegradable polymer. Soluble in chloroform, MDC, benzene, ethylene carbonate.	16916-10	10 g
Poly(2-hydroxyethyl methacrylate) [24249-16-5] MW ~200,000 n_D^{20} 1.512 Tg 55° TSCA $[CH_2C(CH_3)(CO_2CH_2CH_2OH)-]_n$ Polymer is water-insoluble but water-swellable. Used as a hydrogel. See 2-hydroxyethyl methacrylate. Soluble in 95% lower alcohols (5% water), DMF.		
powder *A2g*	09689-25	25 g
12% soln. in ethanol *CH5g*	18894-100	100 ml
Poly(2-hydroxyethyl methacrylate/methacrylic acid) [90:10] [31693-08-0] *A2g* TSCA Hydrophilic polymer, more readily water-soluble than poly(2-hydroxyethyl methacrylate), in the presence of alkali and aqueous 90% methanol.	08725-10	10 g
Poly(2-hydroxypropyl methacrylate) [25703-79-1] *A2g* Tg 76° TSCA $(CH_2C(CH_3)[CO_2CH_2CH(OH)CH_3]-)_n$ Hydrophilic polymer. Soluble in lower alcohols.	09690-10 09690-50	10 g 50 g
Poly(4-iodostyrene/styrene/divinylbenzene) ~58:40:2 [72330-89-3] *U4g* 200–400 mesh Reactive styrene polymer easily converted into other derivatives via the iodine atom. Technical Data Sheet #920	18148-5	5 g
Polyisobutylene [9003-27-4] *A2g* n_D^{20} 1.505 -1.510 Tg -73° TSCA $[-CH_2C(CH_3)_2-]_n$ Generally inert, tacky, polymers. Primarily used as tackifying agent in polymer formulations.		
MW 500 Viscosity 210–227 cps @ 38° liquid	09894-100	100 g
MW 1,350 Viscosity 30,000 cps @ 38° viscous liquid	09896-100	100 g
Poly(dl-lactic acid) [26969-66-4] *AK2bf* d 1.25 Tg 55° Amorphous, biodegradable polymer. Polydispersity 1.8 Soluble in MDC, THF, ethyl acetate, acetone.		
i.v. 0.15–0.30 MW 15,000	22505-10	10 g
i.v. 0.35–0.45 MW 20,000–30,000	16585-10	10 g
i.v. 2.0–2.8 MW 300,000–600,000	23976-10	10 g

			Catalog #	Size
Poly(l-lactic acid) [33135-50-1] *AK2bf* mp 173–178° Tg 60–65° [-OCH(CH_3)CO-]$_n$ Biodegradable polymer. Degradation rate is inversely related to polymer molecular weight. Crystalline polymer with higher molecular weight polymers having a crystallinity of about 70%.				
i.v. 0.10–0.20	MW ~1,600–2,400		18580-10	10 g
i.v. 0.80–1.20	MW ~140,000–160,000	d 1.24	06529-1	1 g
			06529-10	10 g
i.v. 1.30–1.60	MW ~80,000–100,000		18402-10	10 g
i.v. 4.00–5.00	MW ~325,000–460,000	d 1.15	18582-10	10 g
i.v. >7.00	MW ~700,000		21512-10	10 g
Poly(l-lactic acid) Molecular Weight Kit *HK2bg* Biodegradable polymer. Degradation rate is inversely related to polymer molecular weight. **Kit Contains**: 5g each of polymers with i.v. values of 0.10–0.20, 0.80–1.20, 1.30–1.60, 4.00–5.20			18599-1	1 kit
Poly(dl-lactide/glycolide) [26780-50-7] *HK2bg* [-OCH(CH_3)CO-]$_x$[-OCH$_2$CO-] Biodegradable polymers. Copolymers are easier to synthesize than homopolymers. Polydispersity 1.8 Soluble in MDC, THF, ethyl acetate, acetone.				
[90:10]	i.v. 0.15–0.30	MW 10,000	19076-5	5 g
[85:15]	i.v. 0.55–0.75	MW ~20,000 Tg 50–55° d 1.27	23989-5	5 g
[75:25]	i.v. 0.55–0.75	MW ~97,000 Tg 50–55° d 1.30	25107-5	5 g
[80:20]	i.v. 0.15–0.30	MW 10,000 Tg 50–55°	19077-5	5 g
[70:30]	i.v. 0.12–0.3	MW 10,000	19247-5	5 g
[50:50]	i.v. 0.50–0.65	MW ~12K – 16K Tg 45–50° d 1.34	23986-5	5 g
[50:50]	i.v. 0.8 – 1.2	MW 150,000 Tg 45–50°	23987-5	5 g
Poly(l-lactide/glycolide) [70:30] [30846-39-0] *AK2bf* Biodegradable polymer. Polydispersity 1.8				
i.v. 0.15–0.30	MW <10,000		16587-5	5 g
i.v. 0.40–0.60	MW 10,000–20,000	powder	21864-5	5 g



			Catalog #	Size

Poly(Lactic Acid-co-Glycolic Acid) Uniform Dry Microspheres *HK5cd*
(PLGA)
We offer microspheres comprised of two PLGA polymer ratios (50:50 and 75:25 Lactic Acid:Glycolic Acid) in three narrow sizes (75µm, 100µm and 120µm; 5-10% CVs). These highly uniform particle populations serve as excellent models for controlled degradation rate measurements, and for the development of prototype scaffolds or devices. Lyophilized to resist biodegradation. Custom quotations on other PLGA microparticles, alternative biodegradable polymer family types or microparticles with specific active components upon request. Technical Data Sheet #858



(LA:GA) 50:50	MW ~150,000	Size Range 70–80µm	25401-100	100 mg
			25401-250	250 mg
			25401-500	500 mg
(LA:GA) 50:50	MW ~150,000	Size Range 95–105µm	25402-100	100 mg
			25402-250	250 mg
			25402-500	500 mg
(LA:GA) 50:50	MW ~150,000	Size Range 115–125µm	25403-100	100 mg
			25403-250	250 mg
			25403-500	500 mg
(LA:GA) 75:25	MW ~90,000	Size Range 70–80µm	25398-100	100 mg
			25398-250	250 mg
			25398-500	500 mg
(LA:GA) 75:25	MW ~90,000	Size Range 95–105µm	25399-100	100 mg
			25399-250	250 mg
			25399-500	500 mg
(LA:GA) 75:25	MW ~90,000	Size Range 115–125µm	25400-100	100 mg
			25400-250	250 mg
			25400-500	500 mg

Poly(lauryl acrylate), 20% soln. in toluene [26246-92-4] *CH6g* . . . . . 09697-25 — 25 g
Tg ~ -3° TSCA
Tacky, low Tg acrylic polymer. Prepared from lauryl alcohol of natural origin,mixed C8-C16 alcohols, principally C12. Hydrocarbon soluble polymer.

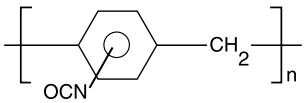
Poly(lead methacrylate 2-ethylhexanoate/methyl methacrylate)
[83:17] (by wt.) [71052-47-6] *UV7g* . . . . . 16399-25 — 25 g
Radio-opaque polymer.

Poly(l-lysine hydrobromide) [25988-63-0] *U5g*
Cationic polymer. Used to improve cell adhesion to solid surfaces.
Journal of Cell Biology, Mazia, Schatten & Sale, 66 (1975) page 198.

MW 50,000	powder	18619-50	50 mg
MW 275,000		25724-100	100 mg
MW 80,000	0.1% soln. in water	09730-25	25 ml
		09730-250	250 ml
MW 120,000	powder	21430-100	100 mg

	Catalog #	Size
Poly(maleic acid), 50% soln. in water [26099-09-2] *H5g* MW 800–1200 d 0.97 TSCA Polyacid, water-soluble.	09732-10	10 g
Poly(maleic anhydride) [24937-72-2] *U5g* MW ~10,000 TSCA Polymer reacts with amines, alcohols.	02348-5	5 g
Poly(maleic anhydride 1-octadecene) 1:1 (molar) [25266-02-8] *A2g* MW 30,000–50,000 d 0.97 TSCA Alkali-soluble hydrophobic resin. Reacts with amines and alcohols. Soluble in organic solvents such as; acetone, benzene, carbon tetrachloride, decalin, dimethylcarbitol, ethyl acetate, methyl isobutyl ketone and 1,2-dichloroethane. Insoluble in alcohols such as ethanol and propanol. Will slowly dissolve as esterification of the anhydride occurs.	05152-100	100 g
Polymethacrylamide [25014-12-4] *A2g* Hydrophilic, water-soluble polyamide. Soluble in water, methanol, ethylene glycol and acetone.	16144-10	10 g
Poly(methacrylic acid) [25087-26-7] *HU7g* MW ~100,000 Tg 228° TSCA Water-soluble polymer. Soluble in water, methanol, alkaline water.	00578-10 00578-50	10 g 50 g
Poly(methacrylic acid) ammonium salt, 30% soln. in water [25086-15-1] *H5g* (7.5g polymer) MW 15,000 Viscosity 75–200 cps (pH 8.0–9.5) TSCA $[-CH_2C(CH_3)(CO_2H)-]_x[-CH_2C(CH_3)(CO_2H)-]_y$ Low molecular weight, water-soluble polymer. Forms insoluble polysalts with polyamines. Used as a pigment dispersant.	21169-25	25 g
Poly(methacrylic acid) sodium salt, 30 % soln. in water [25086-62-8] *H2g* MW 15,000 Viscosity 200 cps pH 10 TSCA Low molecular weight, water-soluble polymer. Forms insoluble polysalts with polyamines. Used as a pigment dispersant.		
(7.5g polymer)	21170-25	25 g
(30g polymer)	21170-100	100 g
Poly(2-methacryloxyethyltrimethylammonium bromide) [68912-04-9] *H2g* (2g polymer) MW 200,000 Cationic (quaternary ammonium), water-soluble polymer. Soluble in 20% in water.	21746-10	10 g
Poly(methacryloyl chloride), 25% soln. in dioxane [26937-45-1] *CHM6g* (2.5g polymer) Polymer reacts readily with alcohols and amines. Can be used to prepare polymers bearing bioactive molecules.	04315-10	10 g

				Catalog #	Size
Poly(methyl methacrylate) [9011-14-7] *A2g* n_D^{20} 1.49 d 1.20 Tg 105° TSCA $[-CH_2C(CH_3)(CO_2CH_3)-]_n$ Hard, stable, non-yellowing polymer used in coating and in molded clear plastic objects. Soluble in acetone, toluene, chloroform, MEK, THF.					
i.v. 0.18	MW 25,000	atactic beads, 200µm	Polydispersity ~3.0	04554-500	500 g
i.v. 0.40	MW 75,000	atactic beads, 200µm	Polydispersity ~2.8	04553-500	500 g
	MW 100,000	atactic pellets		17913-500	500 g
i.v. 1.25	MW 500,000	atactic beads, 200µm	Polydispersity 2.7	04552-500	500 g
Poly(methyl methacrylate/n-butyl methacrylate) [26284-14-0] *A2g* . . . . . . MW ~25,000 Tg 50° TSCA Used in coatings. Molar Ratio of MMA/BMA: ~1:2.				01922-500	500 g
Poly(methyl methacrylate/methacrylic acid) [25086-15-1] *A2g* TSCA $[-CH_2C(CH_3)(CO_2CH_3)-]_x[-CH_2C(CH_3)(CO_2H)-]_y$ Random copolymer. Used in positive electron beam photoresists. Soluble in ethyl cellosolve acetate, 9:1 IPA-water.					
[75:25]	MW ~1.2 million			08208-100	100 g
[80:20]				08221-100	100 g
[90:10]	MW ~100,000			08207-50	50 g
[95:5]	MW ~500,000	powder	Dispersity ~4	19629-100	100 g
Poly(methyl methacrylate/methacrylic acid 5 aminofluoresceinamine) *A2g* . . . . . . MW ~100,000 TSCA $[-CH_2C(CH_3)(CO_2CH_3)-]_x[-CH_2C(CH_3)(CO_2H)-]_y$ [~90:91% wgt] Fluorescent Polymer. Random copolymer. Used in positive electron beam photoresists. Fluorescent label: 1% weight. Soluble in ethyl cellosolve acetate, 9:1 IPA-water.				24911-1	1 g
Poly[methylene(polyphenyl) isocyanate] [9016-87-9] *H5g* . . . . . . MW ~360 d 1.24 TSCA $[-C_6H_3(NCO)CH_2-]_n$ Low molecular weight polyisocyanate, reacts with glycols, polyamines to form gels. NCO content ~30% Soluble in acetone, THF, toluene.				03099-100	100 g
Poly(α-methylstyrene) [25014-31-7] *H4g* $[-CH_2C(CH_3)(C_6H_5)-]_n$ Oligomers with well defined melting points.					
MW 5,000	Tg 168°	TSCA		07630-500	500 g
MW ~850,000	Mw/Mn ~1.08			24867-250	250 mg
Poly(4-methylstyrene/styrene) [90:10] [24936-42-3] *A2g*				19831-10	10 g

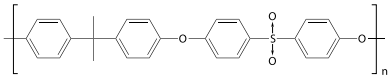


	Catalog #	Size
Poly(N-methylvinylamine) [31245-56-4] *U2g* MW ~500,000 Water-soluble all-secondary polyamine.	24038-5	5 g
Poly(N-methyl N-vinyl acetamide) homopolymer *HK4g* Off white to slightly yellow powder A free flowing solid that has hydrophilic character. The material may be converted to poly(N-methyl vinyl amine) by subsequent hydrolysis of the acetamide functional group.	24810-50	50 g
Poly(octadecyl methacrylate) [25639-21-8] *CH6g* (40g polymer) MW ~170,000 Tg -100° TSCA $(-CH_2C(CH_3)[CO_2(CH_2)_{17}CH_3]-)_n$ Long-chain alkyl methacrylate. Soluble in hydrocarbons.	04321-100	100 g
Poly(oxyethylene) sorbitan monolaurate (Tween 20®) [9005-64-5] *A2g* MW 1,227.5 n^{20}_D 1.468 d 1.095 TSCA Water-soluble surfactant. Technical Data Sheet #912	06110-100	100 g
Poly(N-iso-propylacrylamide) [25189-55-3] *A2g* MW ~40,000 mp >200° Tg 85° TSCA Polymer is water-soluble at room temperature, insoluble above ~40°. Solubility ceiling has been used in mold and cell growth techniques since cells adhere to polymer film at incubation temperatures and are released as medium is cooled and polymer is dissolved. Soluble in THF, dioxane, DMF, cold water, chloroform.	21458-10	10 g
Polypropylene *A2g* TSCA $[-CH_2CH(CH_3)-]_n$ Widely used polyolefin. Soluble in chlorinated hydrocarbons, aromatic hydrocarbons, isoamyl acetate. Technical Data Sheet #920		

[9003-07-0]	Tg -13°	mp 165°	Chromatographic Grade 25–85µm	04342-100	100 g
[9003-07-0]			Chromatographic Grade 150µm	06068-100	100 g
Atactic	Tg –13°	n^{20}_D 1.474		23968-100	100 g
[25085-53-4]	Tg -8°	mp 176–186°	Isotactic MW 220,000 / Mn 40,000 flakes	06536-100	100 g

Poly(propylene glycol) (600) diglycidyl ether [26142-30-3] *H4g* Viscosity 60–180 cps WPE ~530 TSCA Crosslinker for amine-, hydroxyl-, and carboxyl-functional polymers.	24046-100	100 g
Poly(propylene glycol) dimethacrylate [25852-49-7] *HO7d* MW of PEG Block = 400 bp >300° n^{20}_D 1.452 d 1.01 100 ppm MEHQ & 100 ppm BHT TSCA $H_2C=C(CH_3)CO(OC_3H_6)_nO_2CC(CH_3)=CH_2$ Water-insoluble crosslinking monomer. (n) value is MW of PEG unit.	04380-250	250 g

	Catalog #	Size
Poly(propylene glycol) [25322-69-4] *A2g* (propylene oxide) n_D^{20} 1.450 Tg -75° TSCA $H[OCH(CH_3)CH_2]_nOH$ More hydrophobic than poly(ethylene glycol). Polymer is water-insoluble but is water dispersible. Soluble in acetone, toluene, chloroform, dioxane, THF.		
MW 400 d 1.007 Hydroxyl number 263mg KOH/g polymer	04784-250	250 g
MW 4,000 d 1.005 Hydroxyl number 28 mg KOH/g polymer	04788-250	250 g
Poly(iso-propyl methacrylate) [26655-94-7] *A2g* n_D^{20} 1.473 Tg 79° $(-CH_2C(CH_3)[CO_2CH(CH_3)_2]-)_n$	07052-10	10 g
Polypyrrole [30604-81-0] *A2g* Conductive polymer. Not soluble in any organic solvents or water. Conductivity 12 S/cm.	21304-5	5 g
Polystyrene [9003-53-6] mp 240° atactic flakes TSCA $[-CH_2CH(C_6H_5)-]_n$ Widely used high Tg polymer. Soluble in toluene, MEK, THF, dioxane, xylene.		
MW 800–5,000 softening point 125°	23637-100	100 g
MW 50,000 bimodal with MW ~50,000 &1500 (50:50)	18544-100	100 g
MW 125,000–250,000	00574-100	100 g
Polystyrene, brominated [88497-56-7] *H2g* (Bromine 66%) d 2.1 Tg 130 – 140° powder TSCA Polystyrene with reduced flammability.	21305-100	100 g
Poly(styrene-b-isoprene-b-styrene) *A2g* MW 19,000 (6,500/6,000/6,500)	18347-250	250 mg
Poly(styrene/acrylonitrile) [75:25] [9003-54-7] *A2g* n_D^{20} 1.570 d 1.08 TSCA $[-CH_2CH(C_6H_5)-]_x[-CH_2CH(CN)-]_y$ High Tg polymer used as molding compound.	07053-500	500 g
Poly(styrene/butadiene) [85:15] [9003-55-8] *A2g* MW ~110,000 d 1.05 Tg 33-41° C TSCA $[-CH_2CH(C_6H_5)-]_x(-CH_2CH=CHCH_2-)_y$ Rubber modifier, random copolymer. Soluble in aromatic and chlorinated hydrocarbons, ketones.	07073-500	500 g
Poly(styrene/divinyl benzene) [9003-70-7] *A2g* TSCA Beads for preparation of crosslinked poly(chloromethylstyrene) Merrifield resins and other functionalized beads. Technical Data Sheet #920		
[98:2] 200–400 mesh	16724-100	100 g
[92:8] 200–400 mesh	04022-100	100 g

	Catalog #	Size
Poly(styrene/maleic anhydride) [009011-13-6] *U2g* n_D^{21} 1.564 TSCA Alternating copolymer. Reactive polymeric anhydride. Reacts with alcohols, amines.		
[67:33] (molar) MW 7,500	03497-500	500 g
[75:25] (molar) MW 9,500 mp 115–130°	03498-500	500 g
Poly(styrene/methyl methacrylate) [70:30] [25034-86-0] *A2g* MW 270,000 n_D^{20} 1.560 Tg 102° Polydispersity ~5 Random copolymer. High Tg polymer.	15783-250	250 g
Poly(styrenesulfonic acid) [28210-41-5] *B6g* (75g polymer) MW 70,000 d 1.10 Viscosity ~200 cps TSCA Water-soluble ionic polymer in acid form. Soluble in lower alcohols, glycols.	08770-250	250 g
Poly(styrenesulfonic acid), sodium salt [25704-18-1] *A2g* d 0.801 g/mL at 25° C TSCA $[-CH_2CH(C_6H_4SO_3Na)-]_n$ Water-soluble ionic polymer in salt form.		
MW 75,000 Polydispersity 3–5 Viscosity 20% AQ 15–55 cps	08772-25	25 g
MW 1,000,000 Polydispersity 3–30	08773-25	25 g
Poly(styrenesulfonic acid/maleic acid), sodium salt [73282-68-5] *HK4g* Water-soluble polymer. Has been used as a pigment dispersant.		
[1:1] (molar) MW 15,000 .25% soln. in water (6.25g polymer)	11795-25	25 g
[3:1] (molar) MW 20,000 Viscosity 30% AQ 30 cps	18407-25	25 g
Poly(styrenesulfonyl fluoride) [705-33-9] *BHO7bg*	16146-5	5 g
Polysulfone [25154-01-2] *A2g* MW 30,000 n_D^{20} 1.633 Tg 176° TSCA High melting polymer used in preparation of filters for biological materials. Cell and protein adhesion is very low. Soluble in DMF, THF, ketones, toluene, chloroform. 	07074-500	500 g
Polysulfone, dihydroxy terminated [25135-51-3] *U4g* Can be modified via hydroxyl groups, converted into graft copolymers.	21186-5	5 g
Poly(tert-butyl methacrylate) [25189-00-8] *U4g* Tg 107° $[-CH_2C(CH_3)[CO_2C(CH_3)_3]-]_n$ Hard, thermally sensitive, methacrylate ester. Decomposes thermally to poly(methacrylic acid).	07037-25	25 g
Poly(tetrafluoroethylene) [9002-84-0] *A2g* n_D^{20} 1.350–1.380 d 2.28 Tg -113° TSCA $(-CF_2CF_2-)_n$ Inert polymer. Soluble in perfluoro kerosene. Technical Data Sheet #920		
(Teflon® 30B) 60% nonionic disp. in H_2O Viscosity ~20 cps	21539-100	100 g
(Teflon® 7A) powder	08816-100	100 g
(Teflon® 6) powder	01344-100	100 g

	Catalog #	Size
Poly(tetrafluoroethylene propylene) (PTFE) *A2g* . . . . . Copolymer.	04615-50	50 g
	04615-250	250 g

Poly(tetramethylene ether glycol) (Polytetrahydrofuran) [25190-06-1] *AK2g*
d .97 Tg -84° TSCA
$H(OCH_2CH_2CH_2CH_2)_nOH$
More hydrophobic polyether than poly(ethylene glycol). Hydroxyl groups at chain ends.Soluble in alcohol, slightly in water.

MW 650	Hydroxyl No. = 170	mp 15°	n^{20}_D 1.462	07784-500	500 g
MW 1,000	Hydroxyl No. = 112	mp 19°		07785-500	500 g
MW 2,900	Hydroxyl No. = 38	mp 35-37°	n^{20}_D 1.464	17746-500	500 g

Poly(N-vinyl acetamide) homopolymer), Crosslinked *HK4g* . . . . . Viscosity 200 mPa at 1 wgt % White to slightly yellow-white powder Cationic resin. *This product is available in convenient protective foil packages for laboratory scale and in bulk quantities for larger projects. Call for custom quotations on large orders.* Soluble in water and alcohol.	24807-50	50 g
Poly(vinyl acetate) [9003-20-7] *A2g* . . . . . MW 90,000 n^{20}_D 1.462 d 1.18 Tg 32° TSCA $[-CH_2CH(O_2CCH_3)-]_n$ Water sensitive resin, readily hydrolyzed. Used to prepare poly(vinyl alcohol) of varying degrees of hydrolysis. Soluble in toluene, acetone, chloroform, alcohol, THF.	06069-500	500 g
Poly(vinyl acetate), 40% hydrolyzed [25213-24-5] . . . . . MW 72,000 TSCA Hydrophilic polymer, highly swollen in water.	17561-25	25 g

Poly(vinyl alcohol) [9002-89-5] *H5g*
mp >220° d 1.29 Tg 85° TSCA
Water-soluble resins of low toxicity. Resins at high % hydrolysis require heating at ~96° C in water for solution. Resins of lower % hydrolysis can be dissolved at progressively lower temperatures with 88% hydrolyzed resin requiring only 85° C for solution.

MW ~6K	80 mol% hydrolyzed	Polydispersity ~1.7	Viscosity 2.5–3.5% @ 4% AQ cps	22225-500	500 g
MW ~25K	88 mol% hydrolyzed	Polydispersity ~1.9	Viscosity 5.2–6.2% @ 4% AQ cps	02975-500	500 g
MW ~25K	98 mol% hydrolyzed	Polydispersity ~2.0	Viscosity 5.5–6.0% @ 4% AQ cps	04397-500	500 g
MW ~78K	88 mol% hydrolyzed	Polydispersity ~1.9	Viscosity 23–27% @ 4% AQ cps	15132-500	500 g
MW ~78K	98 mol% hydrolyzed	Polydispersity ~1.7	Viscosity 28.5–32.5% @ 4% AQ cps	15130-500	500 g
MW ~78K	99.7 mol% hydrolyzed	Polydispersity ~1.7	Viscosity 28–3 2% @ 4% AQ cps	15129-500	500 g
MW ~108K	99.7 mol% hydrolyzed	Polydispersity ~1.7	Viscosity 62–72% @ 4% AQ cps	04324-500	500 g
MW ~125K	88 mol% hydrolyzed	Polydispersity ~2.0	Viscosity 45–55% @ 4% AQ cps	04398-500	500 g
MW ~133K	99 mol% hydrolyzed	Polydispersity ~2.4	Viscosity 62–72% @ 4% AQ cps	02815-500	500 g

	Catalog #	Size
Poly(vinyl alcohol), N-methyl-4(4'-formylstyryl) pyridinium methosulfate acetal [107845-59-0] *U5acd* (10g polymer) (sbQ-PVA) MW ~45,000 4.1 mol SbQ TSCA Polymer has high dielectric constant. Water-soluble, photocrosslinkable, polymer. Used in making silkscreen print screens. Soluble in organic solvents such as acetone.	22570-75	75 g
Poly(vinylamine) hydrochloride [26336-38-9] *U5g* MW 25,000 TSCA Water-soluble all-primary polyamine.	23965-1 23965-5	1 g 5 g
Poly(vinyl butyral) *A2g* n_D^{20} 1.480–1.490 d 1.100 Tg 50° TSCA Tough, solvent-soluble, resin. Broad MW distribution. Contains ~20% vinyl alcohol and ~2% vinyl acetate, the rest butyral. Soluble in acetone, alcohols, THF, MEK.		
MW 70,000–100,000	24617-50	50 g
MW 100,000–150,000	06100-50	50 g
Poly(N-vinylcarbazole) [25067-59-8] *A2g* MW ~40,000 mp >320° n_D^{20} 1.683 Tg 200° TSCA Photoconductive polymer, especially in the form of complexes. Soluble in toluene, chloroform, THF, Dioxane. Technical Data Sheet #263	02428-50	50 g
Poly(vinyl chloride) [9002-86-2] *A2g* MW 110,000 n_D^{20} 1.540-1.550 d 1.39 Polydispersity ~2 <75µm Tg 81° TSCA $[-CH_2CH(Cl)-]_n$ Widely used industrial resin with good resistance to water, other environmental factors.	09708-250	250 g
Poly(vinyl cinnamate) [9050-06-0] *A2g* TSCA $[-CH_2CH(O_2CCH{=}CHC_6H_5)-]_n$ Photocrosslinkable polymer. Soluble in THF, NMP (may contain some insoluble material).	02648-10	10 g
Poly(vinylidene chloride/acrylonitrile) [80:20] [9010-76-8] *A2g* MW 150,000 d 1.6 Viscosity 2% DMF 2.2 cps Tg 50° TSCA $(-CH_2CCl_2-)_x[-CH_2CH(CN)-]_y$ Polymer with barrier properties as coatings or films. Soluble in DMF, THF.	09747-100	100 g
Poly(vinylidene fluoride) [24937-79-9] *A2g* mp 155–160° n_D^{25} 1.420 d 1.76 Tg -40° TSCA $(-CH_2CF_2-)_n$ Inert coating resin. Polydispersity 2.5–3.0 Soluble in DMF, DMAc, DMSO, ethylene carbonate.		
mp 165–172° melt viscosity 5–12K poise (ASTM D-3835)	15190-100	100 g
mp 165–172° melt viscosity 15–23K poise	15191-100	100 g
mp 160° melt viscosity 26K poise	06094-100	100 g
mp 155–160° melt viscosity 28–34K poise	18734-100	100 g

	Catalog #	Size
Poly(vinyl chloride/vinyl acetate/maleic acid) [86:13:1] [25085-82-9] *A2g* . . . . . d 1.35 Viscosity i.v. 0.50 Tg 74° TSCA Internally plasticized poly(vinyl chloride), improved solubility in organic solvents and improved adhesion to substrates.	18356-500	500 g
Poly(vinyl methyl ether), 50% aqueous solution [9003-09-2] *H4gm* . . . . . MW ~30,000 n^{20}_{D} 1.467 d 1.030 Tg -34° $[-CH_2CH(OCH_3)-]_n$ Tacky resin. Water-insoluble above 28°. Used to prepare heat-sensitive latex. Soluble in aromatic and chlorinated hydrocarbons, alcohols, esters, glycols.	03032-500	500 g
Poly(vinyl methyl ether), 50% methanol solution *C5g* . . . . . Viscosity 4500–6500 mPa-s Liquid $CH_3OCH:CH_2)_n$	25505-100	100 g
Poly(vinyl methyl ketone) [25038-87-3] *A2g* . . . . . n^{20}_{D} 1.50 d 1.12 $[-CH_2CH(COCH_3)-]_n$ Reactive polyketone. Soluble in ketones, THF, dioxane, DMF, chloroform, ethyl acetate.	04320-10	10 g
Poly(2-vinyl-1-methylpyridinium bromide, 20% soln. in water [29471-77-0] *H4g* . . . . . (2g polymer) MW 50,000 Cationic quaternary ammonium polymer. Degree of quaternization ~50%	21477-10	10 g
Poly(4-vinylphenol) [24979-70-2] *A2g* n^{20}_{D} 1.600 d 1.2 Tg 150° TSCA $[-CH_2CH(C_6H_4OH)-]_n$ Reactive polyphenol. Has applications in photoresists. Soluble in THF, lower alcohols, dioxane. Technical Data Sheet #198		
MW 1,500–7,000 Polydispersity 1.5 – 2.2	06527-10	10 g
	06527-50	50 g
MW 9,000–11,000 Polydispersity ~3	18979-10	10 g
	18979-50	50 g
MW 22,000 Polydispersity ~5 SIze -50	18980-10	10 g
MW 9,000–11,000 Polydispersity ~3	25447-10	10 g
	25447-50	50 g
Poly(4-vinylphenol) brominated, 50% Br *A2g* . . . . . MW 8,000 Tg 120° Polydispersity 2 Softening Point 210° Flame-retardant polymer. Technical Data Sheet #198	09762-50	50 g
Poly(vinylphosphonic acid), 30% Soln. [27754-99-0] *BH4g* . . . . . MW 24,000 Polydispersity ~1.24 Water-soluble polymeric phosphonic acid.	24297-10	10 g

		Catalog #	Size
Poly(2-vinylpyridine) [25014-15-7] *A2g* mp >200° Tg 104° TSCA Water-soluble at low pH has adhesive-promoting properties. Soluble in acetic acid, t-butanol, DMF, DMSO, lower alcohols.			
MW 40,000	Viscosity 20% isopropanol 30–90 cps	21382-10	10 g
MW 200K–400K	Viscosity 20% methanol 300–1800 cps	19238-10	10 g
MW 300K–400K		17770-10	10 g
Poly(vinyl phosphoric acid), sodium salt [104626-27-6] *A2g* MW >200,000 Phosphorous content min 5% Water-soluble polymeric phosphate ester. Uncrosslinked.		04391-5	5 g
Poly(2-vinylpyridine) [25232-41-1] d 1.10 Tg 142° TSCA Water-soluble at low pH, has adhesive-promoting properties. Soluble in acetic acid, t-butanol, DMF, DMSO, lower alcohols.			
MW 50,000	Viscosity 20% methanol solution 15–50 cps *H5g*	00112-50	50 g
MW 150,000–200,000	*A2g*	22176-50	50 g
Poly(N-vinyl acetamide-co-sodium acrylate) *HK4fg* Viscosity 300 mPa at 0.2 wgt % Tg 192° C White to slightly yellow-white powder Cationic resin. *This product is available in convenient protective foil packages for laboratory scale and in bulk quantities for larger projects. Call for custom quotations on large orders.* Soluble in water and alcohol.		24809-50	50 g
Poly(4-vinylpyridine / divinylbenzene) [19017-40-7] *U7g* Used as absorbent and ion-exchange resin. Technical Data Sheet #920		06579-10	10 g
Poly(2-vinylpyridine N-oxide) [9016-06-2] *A2g* MW 300,000–400,000 Water-soluble cationic resin. Soluble in alcohols.		01564-10	10 g
Poly(4-vinylpyridine N-oxide) [26715-00-4] *A2g* MW ~200,000 Water-soluble cationic resin. Soluble in alcohols.		23684-10	10 g
Poly(N-vinyl acetamide) [28408-65-3] *HK4g* (PNVA, Poly(N-vinylacetamide)) MW ~4,060,000 Viscosity 11 mPa at 0.2% Tg 189° C white to off-white powder $[C_4H_7No]_{n'}$ Unlike many polyvinylpyrrolidones (PVPs), it offers greater viscosity stability at higher temperatures and in the presence of salts such as sodium chloride. Unlike sodium polyacrylates, Poly(N-vinyl acetamide) maintains stability as a function of pH over a wide range from about pH 2-14. Soluble in moderately soluble in water, methanol, ethanol and blends of alcohols with water.		24808-50	50 g

				Catalog #	Size
Poly(N-vinylpyrrolidone) [9003-39-8] *A2g* n^{20}_{D} 1.530 TSCA Water-soluble polymer used as a thickener, protective colloid. Soluble in alcohols, chloroform, nitroparaffins, water, MDC.					
MW 2,500	Polydispersity 1.9	5% AQ 1.25 – 1.37	Tg ~90° C	16693-250	250 g
MW 4,000–6,000				24737-250	250 g
MW 10,000	Polydispersity 3.6	1% AQ 1.21 – 1.28	Tg 155° C	03315-250	250 g
MW 40,000	Polydisperisty 3.33	1% AQ 2.7	Tg 168° C	01051-250	250 g
MW 40,000, pharma. grade	Polydispersity 3.33	1% AQ	Tg 168° C	01052-250	250 g
MW 1,000,000	Polydispersity ~2.00	1% AQ 4.90	Tg >175° C	06067-250	250 g
Poly(N-vinylpyrrolidone/2-dimethylaminoethyl methacrylate), dimethyl sulfate quaternary [53633-54-8] *A2g* . . . . . . MW 100,000 TSCA Water-soluble cationic (quaternary ammonium) polymer. Soluble in 20% in water.				16294-100	100 g
Poly(N-vinylpyrrolidone/vinyl acetate), 50% soln. in isopropanol [25086-89-9] *CH6g* (50g polymer) d .955 Tg 108° TSCA Hydrophilic neutral polymer. Soluble in alcohols, THF, water, dioxane, ketones, MDC, toluene.					
[30:70]	MW 25,000			09718-100	100 g
[50:50]	MW 45,000			09717-100	100 g
[70:30]	MW 66,000			09716-100	100 g
Poly(vinylsulfonic acid) sodium salt, 25% soln. in water [9002-97-5] *A2g* . . . . . . (25g polymer) MW 4,000–6,000 TSCA Water-soluble anionic polymer. Has been used as a pigment dispersant 25% soln. in water. May contain a small percentage of insoluble material. Soluble in 25% in water.				04392-100	100 g
Pullulan, desalinized [9057-02-7] *A2g* . . . . . . Viscosity 10% AQ solution at 30° 100–180 cps TSCA Natural polysaccharide from Aureobasidium pullulans.				21115-50	50 g

S

Starch, poly(acrylamide/acrylic acid) graft, acid sodium salt [9005-25-8] *H5g* . . . . . . TSCA particle/size 75% between 40–120 mesh pH 7.5. Water-absorbing, water-holding, resin.				08215-100	100 g

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	Catalog #	Size
Adjuncts		
A		
Acrylic cement, MC-Bond *HM6g* Solvent-type cement for acrylic, PETG, or polycarbonate sheet. Forms strong bonds after short contact time. Technical Data Sheet #270	16752-4Q 16752-0.5	4 x 1 qt 4 x 0.5 gal
Alumina, activated powder [1344-28-1] *H5g* MW 102.1 TSCA Al_2O_3 Used to remove inhibitor from monomers. Recommended for use with Inhibitor Removal Column *(Cat. #19708)*.	23678-250	250 g
3-Aminopropyltriethoxysilane [919-30-2] *B6bg* MW 221.37 bp 217° TSCA $H_2N(CH_2)_3Si(OC_2H_5)_3$ Reacts with glass and other silaceous surfaces creating aminopropyl substituents. Surfaces so modified have enhanced adhesion properties and can adsorb anionic matter.	01983-250	250 g
B		
Benzil (Photopolymerization catalyst) *HU5g* MW 210.2 mp 95° TSCA $C_6H_5COCOC_6H_5$ UV polymerization catalyst. Technical Data Sheet #370	01946-25	25 g
Benzoin ethyl ether [574-09-4] *HV7ag* MW 240.3 mp 60° TSCA $C_6H_5CH(OC_2H_5)COC_6H_5$ UV polymerization catalyst.	01359-50	50 g
Benzoin iso-propyl ether [6652-28-4] *H5g* MW 254.3 mp 78° TSCA $C_6H_5CH[OCH(CH_3)_2]COC_6H_5$ UV polymerization catalyst.	00932-25	25 g
Benzoin methyl ether (UV Catalyst) [3524-62-7] *H6g* MW 226.3 mp 47 - 49° TSCA $C_6H_5CH(OCH_3)COC_6H_5$ UV polymerization catalyst.	00425-10	10 g
Benzoyl peroxide, 70% active (water wet) [94-36-0] *FH4gp* MW 242.23 mp 105° TSCA $(C_6H_5CO)_2O_2$ Thermal polymerization catalyst.	21446-100	100 g

	Catalog #	Size
Benzoyl Peroxide, Plasticized [94-36-0] *GH5g* MW 242.23 Dry powder $(C_6H_5CO)_2O_2$ Thermal polymerization catalyst.	24232-100	100 g
N,N-Benzyldimethylamine [103-83-3] *BEH6g* (BDMA; N,N-Dimethylbenzylamine) MW 135.21 mp 75° $C_6H_5CH_2N(CH_3)_2$ Low viscosity epoxy accelerator.	00141-100 00141-500	100 g 500 g
N,N-Bis(2-hydroxyethyl)-4-toluidine, 94% [3007-12-1] *HK3abcd* MW 195.2 mp 50° TSCA $CH_3C_6H_4N(CH_2CH_2OH)_2$ Accelerator or promoter in peroxide-catalyzed polymerizations.	04011-100	100 g
4'4-Bis(dimethylamino)benzophenone [90-94-8] *HM7g* MW 268.4 mp 175° TSCA Photopolymerization catalyst.	03440-50	50 g

C

dl-Camphorquinone [10373-78-1] *U6g* MW 166.22 mp 198 - 200° TSCA (C=2,CH_3OH) Blue light (visible) catalyst for polymerization.	17181-10	10 g

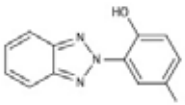
D

Dibutyl phthalate [84-74-2] *H4g* MW 278.4 bp 340° n_D^{20} 1.493 d 1.042 TSCA C_6H_4-1,2-$[CO_2(CH_2)_3CH_3]_2$ Plasticizer for polymers such as poly(vinyl chloride), poly(methyl methacrylate) and poly(vinyl acetate).	00434-450	450 g
Dibutyltin dilaurate [77-58-7] *BH6g* MW 631.6 mp 24° bp 205° n_D^{20} 1.470 d 1.066 Yellowish liquid TSCA $[CH_3(CH_{2\ 10}CO_2]_2Sn[(CH_2)_3CH_3]_2$ Catalyst for polymerizing lactide and glycolide and isocyanate reactions.	01862-50	50 g
4,4'-Difluorobenzophenone [345-92-6] *V5g* MW 218.20 mp 106° - 109° Crystalline powder This UV Light Stabilizer is used extensively in plastics, cosmetics, and films. The primary function is to protect the long-term degradation from all forms of wavelength of light. This benzophenone works by absorbing the UV radiation and preventing the formation of free radicals.	24296-25	25 g

	Catalog #	Size
4,4'-Dihydroxybenzophenone [611-99-4] *U5g* MW 214.20 mp 213° - 215° This UV Light Stabilizer is used extensively in plastics, cosmetics, and films. The primary function is to protect the long-term degradation from all forms of wavelength of light. This benzophenone works by absorbing the UV radiation and preventing the formation of free radicals.	24295-25	25 g
Dimethylaminoethanol (DMAE) [108-01-0] *BE6g* MW 89.14 bp 130° - 136° TSCA $HOCH_2CH_2N(CH_3)_2$ Curing agent for epoxy resins.	01458-100	100 g
Diphenyl adipate MW 298.3 mp 105° - 106° Solid plasticizer for polymers.	19521-25	25 g
DMP-30 [90-72-2] *BH6g* MW 265.4 bp 316° n^{20}_{D} 1.515 Viscosity ~200 cps Straw to yellow liquid TSCA $[(CH_3)_2NCH_2]_3C_6H_2OH$ Curing catalyst for epoxy resins.	00553-100	100 g
Dodecenylsuccinic anhydride (DDSA) [19780-11-1] *H2g* MW 266.38 bp 181°/5mm n^{20}_{D} 1.479 d 1.005 Viscosity 440 cps TSCA Epoxy hardener, suitable for use in embedding procedures.	00563-450 00563-4	450 g 4 x 450 g

H

2-(2'-Hydroxy-5'-methylphenyl)-benzotriazole [244-22-4] *HO4g* (Tinuvin P®) MW 225.2 mp 128 - 132° d 1.40 yellow granules A highly efficient UV absorbent *(absorbs UV between 270 - 340nm)* used in polystyrene, polyester, polycarbonate, Perspex, polyethylene, ABS resin, epoxy resin and cellulose resin. Absorbs almost no visible light, making it useful for colorless transparent and pale colored products. Can be used in plastic products for food.	21363-25	25 g
2-Hydroxy-4-n-octoxybenzophenone [1843-05-6] *U2g* MW 326.4 mp 47.5° TSCA $CH_3(CH_2)_7OC_6H_3(OH)COC_6H_5$ UV-absorber.	01925-50	50 g



I

Inhibitor Removal Column Inhibitor Removal Column features 250ml capacity. Recommended packing: Alumina *(Cat. #23678)* removes phenolic inhibitor from ~170 volumes of monomer where inhibitor content is 100ppm. The Inhibitor Removal Column is suitable for use with De-Hibit 200 *(Cat. # 24013)* for the removal of phenolic inhibitors from neutral monomers.	19708-1	1 unit

	Catalog #	Size

M, N, O, P, S

Methyl Benzoylformate *H7ad* . . . . . 17308-25 — 25 g
$C_6H_5COCO_2CH_3$
Synthesis intermediate, photoinitiator for UV curable systems.

Nadic Methyl Anhydride (NMA) [25134-21-8] *HO6g* . . . . . 00886-450 — 450 g
MW 178.2 n_D^{25} 1.505
Liquid anhydride for curing epoxy resins. This material is a mixture of methyl isomers of methylbicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic anhydride. The larger the proportion of NMA used in the epoxy resin formula, the harder the resultant block.

Nonenyl Succinic Anhydride (NSA), EM Grade [28928-97-4] *H4g* . . . . . 01542-450 — 450 g
01542-4 — 4 x 450 g
Acid Number min. 470 MW 224 n_D^{20} 1.476 (lit.) d 1.032
Curing agent for epoxy resins.
J. Biochem., 113, 573 (1993)

Octenylsuccinic anhydride [26680-54-6] *H7g* . . . . . 19830-100 — 100 g
MW 210.3 bp 320° n_D^{20} 1.469 d 1.000 TSCA
Used as a replacement for hexenylsuccinic anhydride in Polyscience' Ultra Low Viscosity Epoxy Embedding Kit, *(Cat. #17706)*. Acid Number min. 520

Poly/Bed® 812 Embedding Media *H4g* . . . . . 08791-500 — 500 g
Viscosity 100 - 200 cps TSCA
Epoxy resin for embedding. Cured by amine catalysts. Exact WPE number supplied on label, ranging from 140 - 160. Technical Data Sheet #233

2-iso-Propylthioxanthone 97% [5495-84-1] *H4g* . . . . . 21314-25 — 25 g
MW 254.3 mp 66° - 73° Yellow powder TSCA
Photopolymerization catalyst.

SAR-GEL® Water Indicating Paste . . . . . 24615-1 — 1 oz
24615-12 — 12 x 1 oz tubes
Water indicating paste provides a fast, reliable way to detect water bottoms in storage tanks containing gasoline and gasoline/alcohol blends, diesel, jet fuel, fuel oil, solvents and other materials.

Benefits:
- Easy to apply – no messy jars, no need to mix, easy cleanup
- No guessing – complete color change from white to brilliant pink
- Faster reaction – immediate detection means less time wasted
- Easy to see water line – does not run
- Useful in detecting water content in laboratory recycled reagents, as well as other stain line reagents and solvents such as xylene and absolute alcohol

T, U

Tinuvin Acid *H4bg* . . . . . 25473-1 — 1 g
25473-5 — 5 g
(Ciba Geigy) Solid
Tinuvin based compounds are used as UV absorbers and as building blocks for drug development. Tinuvin acid is a hydroxyphenyl-benzotriazole compound with an acid group that allows further reactivity. Related derivatives of this compound have been used as UV absorbers that provide efficient protection of light sensitive substrates.

	Catalog #	Size
2,4,6-Trimethylbenzoyldiphenylphosphine oxide [75980-60-8] *H4ag* . . . . . MW 348.0 mp 87° - 93° C Yellow crystals $(CH_3)_3C_6H_2COP(O)(C_6H_5)_2$ Photopolymerization initiator.	24067-10	10 g
12-Tungstosilicic Acid [12027-43-9] *A2bg* . . . . . (silicotungstic Acid) MW 3310.7 Soluble in water. $H_4SiO_412WO_3XH_2O$ Catalyst for organic synthesis, minerals separation, reagent for alkaloids. Formula Weight: 2878.28 (anhy)	03424-25	25 g
Uvitex® 2B [27344-41-8] *BH6g* . . . . . (C.I. Fluorescent Brightener 362; Derivative of stilbene disulfonic acid.) Yellow powder TSCA UV absorver. Ex. max: 350nm Em. max: 435nm in PBS Buffer	19517-10	10 g

W

New! Wolbers Solvent Gel Kit™ *C4g*

Renowned conservator Richard Wolbers has partnered with Polysciences, Inc. to make his well-known solvent gels available in convenient, ready-to-use kits. Available as single 100 mL jars, Standard Kits, Mix & Match Kits or in bulk quantities. Kits can be customized to include the specific gels and quantities desired. (for example; 3 xylene gels, 2 acetone gels and 1 NMP gel can be purchased in a Mix and Match Kit)

Features:

- Clean aged, discolored and soiled varnish
- 6 gels, with a range of polarities
- No mixing, formulating or chemical handling required
- Gel form increases the working time for coating removal

Wolbers Solvent Gel Kit™	25674-1	1 kit
PolySol™ D60 Gel	25675-100	100 ml
Xylene Gel	25676-100	100 ml
Benzyl Alcohol Gel	25677-100	100 ml
Isopropanol Gel	25678-100	100 ml
Acetone Gel	25679-100	100 ml
NMP Gel	25680-100	100 ml

Polymer Standards & Kits

Polysciences, Inc., provides a comprehensive series of carefully characterized, ultrapure, polymer and particle standards for use in calibrating columns and instruments. Polymer molecular weight standards were prepared by techniques which yield narrow molecular weight distribution and when this is not possible by fractionation of polymers of broader molecular weight distribution. We have listed standards of a range of molecular weights for widely studied polymers. For your special needs we can prepare quotes on items not listed.

Molecular Weight Standards

Each catalog listing for a molecular weight standard describes the polymer by an approximate Molecular Weight (MW) and an approximate polydispersity value (Mw/Mn). The Molecular Weight averages have been rounded for descriptive purposes.

Homopolymers, Individual Standards and Kits

		Catalog #	Size
Dextran [9004-54-0] *A2g* Soluble in water.			
MW ~10,000	Mw/Mn ~1.50	19411-250	250 mg
MW ~40,000	Mw/Mn ~1.50	19412-250	250 mg
MW ~60,000	Mw/Mn ~1.70	24832-250	250 mg
MW ~180,000	Mw/Mn ~2.16	24239-250	250 mg
MW ~500,000	Mw/Mn ~3.25	24766-250	250 mg
MW ~636,400	Mw/Mn ~1.80	24767-250	250 mg
Polyacrylamide [9003-05-8] *A2g* Soluble in water.			
MW 12,000	Mw/Mn ~1.50	18255-250	250 mg
MW 22,000	Mw/Mn ~1.60	18256-250	250 mg
MW 65,000	Mw/Mn ~1.60	18257-250	250 mg
MW 80,000	Mw/Mn ~1.80	19410-250	250 mg
MW 400,000	Mw/Mn ~2.60	19790-250	250 mg
MW 600,000	Mw/Mn ~2.50	18259-250	250 mg
MW 1,000,000	Mw/Mn ~2.50	18260-250	250 mg
MW 5,000,000	Mw/Mn ~2.30	18263-250	250 mg
MW 9,000,000	Mw/Mn ~2.10	18543-250	250 mg
Poly(acrylic acid), sodium salt [9003-04-7] *H4g* Soluble in water.			
MW 2,000	Mw/Mn ~1.60	18744-250	250 mg
MW 5,000	Mw/Mn ~1.60	18745-250	250 mg
MW 8,000	Mw/Mn ~1.30	18746-250	250 mg
MW 20,000	Mw/Mn ~1.40	18747-250	250 mg
MW 35,000	Mw/Mn ~1.60	18748-250	250 mg
MW 70,000	Mw/Mn ~1.80	18749-250	250 mg
MW 85,000	Mw/Mn ~1.80	18750-250	250 mg

	Catalog #	Size
MW 150,000 Mw/Mn ~1.70	18751-250	250 mg
MW 250,000 Mw/Mn ~1.60	18752-250	250 mg
MW 500,000 Mw/Mn ~1.60	18753-250	250 mg
MW 800,000 Mw/Mn ~1.60	18754-250	250 mg
MW 1,300,000 Mw/Mn ~1.50	18755-250	250 mg

Polybutadiene [9003-17-2] *A2g* . . . . . 09827-1 1 g
MW ~2,800 Mw/Mn ~1.20 Soluble in solvents: hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters.

Poly(tert-butyl methacrylate) [9003-31-0] *A2g* . . . . . 21175-250 250 mg
MW ~10,000 Mw/Mn ~1.07 Soluble in solvents: hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters. Can be easily transesterified to prepare standards for other methacrylate esters.

Polyethylene

NIST Standard for determining melt flow rate in polymers. Melt flow rate is widely used in polymer technology as a product specification since this value, which includes a statement of the load and temperature under which it is obtained, gives an indication of the processing properties of the polymer.[1, 2]

1. ASTM D 1238-00; Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer; ASTM Standards, Vol. 08.01, American Society for Testing and Materials, West Conshohocken, PA (2001) 2. Taylor, B.N.; Guide for the Use of the International System of Units (SI); NIST Special Publication 811; Ed. (April 1995)

Polyethylene, branched [9002-88-4] *A2g* . . . . . 08277-1 1 g
Soluble in Solvents (hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters). Limiting viscosity number = 0.8132 dl/g in 1-chloronaphthalene.

Polyethylene, linear [9002-88-4] *A2g* . . . . . 09829-1 1 g
MW 52,000 Mw/Mn ~2.90 Soluble in 1-chloronaphthalene, 1,2,4-trichlorobenzene, decalin above 80°.

Poly(ethylene glycol) [25322-68-3] *A2g*
Soluble in water, benzene, chloroform, dimethylformamide, esters, alcohols.

MW ~600 Mw/Mn ~1.10	15645-1	1 g
MW ~1,000 Mw/Mn ~1.10	15646-1	1 g
MW ~1,500 Mw/Mn ~1.10	15647-1	1 g
MW ~5,000 Mw/Mn ~1.10	15648-1	1 g
MW ~9,000 Mw/Mn ~1.10	15649-1	1 g
MW ~11,000 Mw/Mn ~1.10	16913-1	1 g
MW ~20,000 Mw/Mn ~1.13	17172-1	1 g

	Catalog #	Size
1, 4-Poly isoprene [9003-31-0] *A2g* Soluble in solvents: hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters. Can be easily transesterified to prepare standards for other methacrylate esters.		
MW ~1,000 Mw/Mn ~1.20	09828-250	250 mg
MW ~4,700 Mw/Mn ~1.15	18006-250	250 mg
MW ~30,000 Mw/Mn ~1.05	16202-250	250 mg
MW ~300,000 Mw/Mn ~1.05	16203-250	250 mg
Poly(methacrylic acid), sodium salt [54193-36-7] *H7g* Soluble in water.		
MW ~7,000 Mw/Mn ~1.04	21180-250	250 mg
MW ~25,000 Mw/Mn ~1.03	21181-250	250 mg
MW ~70,000 Mw/Mn ~1.05	21182-250	250 mg
MW ~350,000 Mw/Mn ~1.03	21184-250	250 mg
Poly(methyl methacrylate) [9011-14-7] *A2g* Soluble in solvents: aromatic hydrocarbons, chlorinated hydrocarbons, methyl ethyl ketone, ethyl acetate.		
MW ~6,000 Mw/Mn ~1.05	21172-250	250 mg
MW ~12,000 Mw/Mn ~1.04	21173-250	250 mg
MW ~30,000 Mw/Mn ~1.10	16204-250	250 mg
MW ~60,000 Mw/Mn ~1.10	16206-250	250 mg
MW ~75,000 Mw/Mn ~1.04	08287-250	250 mg
MW ~100,000 Mw/Mn ~1.10	16209-250	250 mg
MW ~125,000 Mw/Mn ~1.04	08288-250	250 mg
MW ~150,000 Mw/Mn ~1.10	16211-250	250 mg
MW ~185,000 Mw/Mn ~1.10	18756-250	250 mg
MW ~225,000 Mw/Mn ~1.04	21104-250	250 mg
MW ~350,000 Mw/Mn ~1.15	16214-250	250 mg
Poly(methyl methacrylate), isotactic *A2g*	21489-250	250 mg
MW ~100,000	08729-250	250 mg
Poly(alpha-methylstyrene) [25014-7] *A2g* Soluble in solvents: aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters.		
MW ~20,000 Mw/Mn ~1.15	16218-250	250 mg
MW ~400,000 Mw/Mn ~1.05	18530-250	250 mg
MW ~850,000 Mw/Mn ~1.08	24867-250	250 mg

Polypropylene [9003-07-0] *A2g*
Soluble in solvents: hydrocarbons, chlorinated hydrocarbons.

		Catalog #	Size
MW ~50,000	Mw/Mn <2.20	19905-250	250 mg
MW ~100,000	Mw/Mn <3.40	19906-250	250 mg
MW ~140,000	Mw/Mn <3.70	19907-250	250 mg
MW ~200,000	Mw/Mn <4.90	19908-250	250 mg
MW ~230,000	Mw/Mn <5.60	19909-250	250 mg
MW ~350,000	Mw/Mn <8.00	19910-250	250 mg

Polystyrene [9003-53-6] *A2g*
Soluble in solvents: aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters.

MW ~300 (liquid)	Mw/Mn ~1.20	22404-250	250 mg
MW ~500 (liquid)	Mw/Mn ~1.20	22405-250	250 mg
MW ~600	Mw/Mn ~1.30	08279-250	250 mg
MW ~1,000	Mw/Mn ~1.30	16227-250	250 mg
MW ~2,000	Mw/Mn ~1.30	16228-250	250 mg
MW ~4,000	Mw/Mn ~1.04	08280-250	250 mg
MW ~9,000	Mw/Mn ~1.04	16231-250	250 mg
MW ~20,000	Mw/Mn ~1.06	01844-250	250 mg
MW ~30,000	Mw/Mn ~1.06	16234-250	250 mg
MW ~35,000	Mw/Mn ~1.06	16235-250	250 mg
MW ~50,000	Mw/Mn ~1.06	18544-100	100 mg
MW ~63,000	Mw/Mn ~1.04	09821-250	250 mg
MW ~100,000	Mw/Mn ~1.06	00867-250	250 mg
MW ~200,000	Mw/Mn ~1.06	02356-2w50	250 mg
MW ~160,000	Mw/Mn ~1.10	18346-250	250 mg
MW ~400,000	Mw/Mn ~1.06	03823-250	250 mg
MW ~600,000	Mw/Mn ~1.10	16239-250	250 mg
MW ~900,000	Mw/Mn ~1.10	16240-250	250 mg
MW ~1,000,000	Mw/Mn ~1.10	16241-250	250 mg
MW ~1,800,000	Mw/Mn ~1.10	16242-250	250 mg
MW ~3,000,000	Mw/Mn ~1.20	07676-250	250 mg
MW ~6,000,000	Mw/Mn ~1.20	16243-250	250 mg
MW ~20,000,000	Mw/Mn ~1.30	16244-250	250 mg
MW ~30,000,000	Mw/Mn ~1.30	16315-250	250 mg

	Catalog #	Size
Polystyrene, 60% isotactic [MW ~ 1,780,000] [25086-18-4] *A2g* . . . . . Soluble in solvents: aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters. Mw/Mn ~2.25 Used as a polystyrene tacticity standard.	02963-250	250 mg
Polystyrene, fluorescein labeled *A2g* Soluble in solvents: aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters. Can be used as a marker in column chromatography.		
MW ~3,200 Mw/Mn ~1.20	21658-100	100 mg
MW ~12,000 Mw/Mn ~1.20	21659-100	100 mg
Poly(styrene sulfonic acid), sodium salt [9080-79-9] *U7g* Soluble in water.		
MW ~1,000 Mw/Mn ~1.20	24812-250	250 mg
MW ~3,600 Mw/Mn ~1.20	24813-250	250 mg
MW ~4,600 Mw/Mn ~1.10	16248-250	250 mg
MW ~8,000 Mw/Mn ~1.10	16249-250	250 mg
MW ~18,000 Mw/Mn ~1.10	16250-250	250 mg
MW ~35,000 Mw/Mn ~1.10	16251-250	250 mg
MW ~67,000 Mw/Mn ~1.20	18008-250	250 mg
MW ~220,000 Mw/Mn ~1.10	16254-250	250 mg
MW ~450,000 Mw/Mn ~1.20	26252-250	250 mg
MW ~509,000 Mw/Mn ~1.15	24831-250	250 mg
Poly(2-vinylpyridine) [25014-157] *A2g* Soluble in solvents: benzene, methanol, tetrahydrofuran, pyridine, water at low pH. Cationic MW standard.		
MW ~3,000 Mw/Mn ~1.29	22509-250	250 mg
MW ~7,000 Mw/Mn ~1.31	22510-250	250 mg
MW ~30,000 Mw/Mn ~1.45	22565-250	250 mg
MW ~240,000 Mw/Mn ~1.70	22563-250	250 mg

	Catalog #	Size
Molecular Weight Standard Kits		
Poly(ethylene glycol) Kit [25322-68-3] . . . . . 5x250mg each of MW 100, 1,000, 5,000, 9,000, 15,000.	16900-1	1 kit
Polstyrene (Broad MW Range) Kit [9003-53-6] . . . . . 10x250mg each of MW 600, 1,000, 4,000, 20,000, 50,000, 100,000, 400,000, 1,000,000, 6,000,000, 20,000,000.	16902-1	1 kit
Polystyrene (Low MW) Kit . . . . . 5x250mg each of MW 4,600, 6,500, 35,000, 67,000, 780,000.	18009-1	1 kit
Poly(styrenesulfonic acid, sodium salt) Kit . . . . . 5x250 mg each of MW 4,600, 6,500, 35,000, 67,000, 780,000.	19918-1	1 kit
Block Copolymer Standards		
There are many possible block copolymer compositions, we have listed only our 2 most popular products with relatively few permutations. Within the polymer systems listed below we are capable of producing many products that fit your particular needs.		
Poly(isoprene-1,4-b-styrene) [MW 135,000] *A2g* . . . . . (~67,500/67,500) Mw/Mn = 1.06	21697-250	250 mg
Poly(methyl methacrylate-b-styrene) [MW 20,500] . . . . . (10,700/9800) Mw/Mn = 1.14	21702-250	250 mg

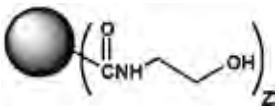
Monodisperse Dendrimers

Polysciences, Inc. has partnered with Dr. Donald A. Tomalia's latest nanotechnology company, NanoSynthons LLC, to make high quality dendrimers available in research quantities. Dr. Tomalia, the pioneering scientist and inventor of dendrimers, founded NanoSynthons to provide high purity building blocks for material science and nanomedicine. "Dendrimer" refers to a broad category of well-defined soft nanoparticles that possess three major architectural components, namely: 1) a core, 2) an interior and 3) surface. Reminiscent of an onion, a dendrimer begins with a core and is grown in size by the construction of a series of concentric layers/shells, derived from branched monomers referred to as generations (G). DAB-PAMAM Dendrimers are available with the following Surface Groups: Amino, Amido-ethanol and Sodium Carboxylate

Amidoethanol Surface Group (Neutral)

Core: DAB **Surface Group**: Amidoethanol **Generation**: 0 - 5

New! Amidoethanol Surface Group (Neutral) *H4f*

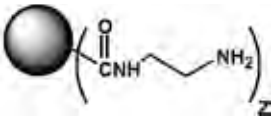


	Catalog #	Size
G0	25698-100	100 mg
	25698-500	500 mg
G1	25699-100	100 mg
	25699-500	500 mg
G2	25700-100	100 mg
G3	25701-100	100 mg
	25701-500	500 mg
G4	25702-100	100 mg
	25702-500	500 mg
G5	25703-100	500 mg
	25703-500	500 mg

Amino Surface Group (Cationic)

Core: DAB **Surface Group**: Amino **Generation**: 0 - 5

New! Amino Surface Group (Cationic) *H4f*

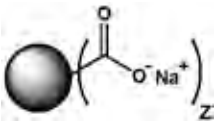


G0	25692-100	100 mg
	25692-500	50 mg
G1	25693-100	100 mg
	25693-500	500 mg
G2	25694-100	100 mg
	25694-500	500 mg
G3	25695-100	100 mg
	25695-500	500 mg
G4	25696-100	100 mg
	25696-500	500 mg
G5	25697-100	100 mg
	25697-500	500 mg

Sodium Carboxylate Surface Group (Anionic)

Core: DAB **Surface Group**: Sodium Carboxylate **Generation**: 0.5 - 5.5

New! Carboxylate Surface Group (Anionic) *H4f*



	Catalog #	Size
G0.5	25704-100	100 mg
	25704-500	500 mg
G1.5	25705-100	100 mg
	25705-500	500 mg
G2.5	25706-100	100 mg
	25706-500	500 mg
G3.5	25707-100	100 mg
	25707-500	500 mg
G4.5	25708-100	100 mg
	25708-500	500 mg
G5.5	25709-100	100 mg
	25709-500	500 mg

Ion Exchange Resins & Cartridges

Purolite® Ion Exchange Resins

Absorbents

Specialty adsorbents are solid copolymers with highly porous structures designed to adsorb and desorb a wide variety of complex molecules and structures in a range of environments.

	Catalog #	Size
A149S, Macroporous Strong Acid Cation Exchange Resin **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Complex Amine **Ionic Form as Shipped**: Free Base	50278-1	1 liter
C150H, Macroporous Strong Acid Cation Exchange Resin **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: H^+	50277-1	1 liter
MN102, Macroporous Weak Base Adsorbent **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Tertiary Amine **Ionic Form as Shipped**: FB	50231-250 50231-1	250 ml 1000 ml
MN202, Macroporous Inert Adsorbent **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene	50230-250 50230-1	250 ml 1000 ml
MN500, Hypersol-Macronet Resin **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: H^+	50276-1	1 liter

Chelating Resins

Chelating resins covers lead, copper, zinc, aluminium, cadmium, nickel, cobalt, magnesium, barium, strontium, iron and mercury. The use of chelation resins covers the large industrial uses as well as the small cartridge based units used in spark erosion type services.

S920, Weak Acid Cation Resin, Isothiouronium **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Isothiouronium **Ionic Form as Shipped**: H^+	50232-250 50232-1	250 ml 1000 ml
S924, Weak Acid Cation Resin, Thiol **Polymer Structure**: Macroporous Polystyrene Crosslinked with Divinylbenzene **Functional Group**: Thiol **Ionic Form as Shipped**: H^+	50233-250 50233-1	250 ml 1000 ml
S930Plus, Weak Acid Cation Resin, Iminodiacetic **Polymer Structure**: Macroporous crosslinked polymer **Functional Group**: Iminodiacetic **Ionic Form as Shipped**: Na^+	50234-250 50234-1	250 ml 1000 ml

	Catalog #	Size
S940, Weak Acid Cation Resin, Aminophosphonic **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Aminophosphonic **Ionic Form as Shipped**: Na^+	50235-250 50235-1	250 ml 1000 ml
S950, Weak Acid Cation Resin, Aminophosphonic **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Aminophosphonic **Ionic Form as Shipped**: Na^+	50236-250 50236-1	250 ml 1000 ml
S955, Mixed Acid Cation Resin **Functional Groups**: Diphosphonic, Sulphonic, Carboxylic acid **Ionic Form as shipped**: H^+ or Ca^{2+}/Mg^{2+}	50238-250 50238-1	250 ml 1000 ml
S957, Mixed Acid Cation Resin **Functional Group**: Phosphonic and Sulfonic Acid **Ionic Form as Shipped**: H^+	50237-250 50237-1	250 ml 1000 ml

High Purity Resins

Ion exchange resins for ultra-pure water are specially manufactured to meet the exacting needs of the electronics industry for wafer and microchip production requiring the highest possible water quality (>18.2 MΩ·cm resistivity, with minimum rinse times), while eliminating contamination of the high purity circuits when ion exchange resin is first installed.

UCW1080, Low TOC Boron Selective Weak Base Anion Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: N-methylglucamine **Ionic Form as Shipped**: Free Base	50243-250 50243-1	250 ml 1000 ml
UCW5072, Low TOC Strong Base Anion Resin **Polymer Structure**: Gel polystyrene with divinylbenzene **Functional Group**: Type 1 Quaternary Ammonium **Ionic Form as Shipped**: OH^-	50240-250 50240-1	250 ml 1000 ml
UCW9126, Low TOC Strong Acid Cation Resin **Polymer Structure**: Gel crosslinked polystyrene with divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: H^+	50239-250 50239-1	250 ml 1000 ml
UCW9964, LOW TOC Separable Mixed Bed Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50241-250 50241-1	250 ml 1000 ml
UCW9966, Low TOC Non-Separable Mixed Bed Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50242-250 50242-1	250 ml 1000 ml

	Catalog #	Size
Inerts		
IP3, Acrylic Polymer for Mixed Bed **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50244-250 50244-1	250 ml 1000 ml
Mixed Bed Resins		
Ready to use mixed beds are specially prepared high quality resin mixtures designed for direct purification of water. The ratio of component resins has been specifically tailored to provide high capacity. Performance, of the ready to use mixed bed, will depend on the application. Several of the mixed beds are available with indicators which facilitate ease of operation where a simple visual indication of exhaustion is desired.		
MB3710, Standard Mixed Bed Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50227-250 50227-1	250 ml 1000 ml
NRW3240, Low Chloride Nuclear Grade Anion Exchange Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50228-250 50228-1	250 ml 1000 ml
UCW3700, Low TOC Mixed Bed **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid and Type 1 Quaternary Ammonium **Ionic Form as Shipped**: H^+ / OH^-	50229-250 50229-1	250 ml 1000 ml
Strong Acid Cation Resins		
These are used in softening and demineralization of water and in other specialist applications. The products offer high physical strength, and efficient operation over a wide range of operating conditions.		
C100, Strong Acid Cation Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: Na^+	50212-250 50212-1	250 ml 1000 ml
C100H, Strong Acid Cation Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: H^+	50213-250 50213-1	250 ml 1000 ml
C100x10H, Strong Acid Cation Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: H^+	50214-250 50214-1	250 ml 1000 ml
C100x16MBH, High Capacity Strong Acid Cation Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic **Ionic Form as Shipped**: H^-	50215-250 50215-1	250 ml 1000 ml

	Catalog #	Size
C160, Macroporous Strong Acid Cation Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Sulfonic Acid **Ionic Form as Shipped**: Na^+	50216-250 50216-1	250 ml 1000 ml

Strong Base Anion Resins

Strong-Base Anion (SBA) exchanger containing Type-II quaternary ammonium groups are used for dealkalization, deionization, demineralization, desilicizers and organic removal. SBA's have excellent operating capacity and good kinetics even when regenerant levels are comparitively low. Specially tailored size grades may be used with excellent results in most of the usual ion-exchange column configurations.

A300, Type II Strong Base Anion Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Type 2 Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50219-250 50219-1	250 ml 1000 ml
A400, Type 1 Porous Strong Base Anion Resin **Polymer Structure**: Gel polystyrene crosslinked with divinylbenzene **Functional Group**: Type 1 Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50218-250 50218-1	250 ml 1000 ml
A500, Type 1 Macroporous Strong Base Anion Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Type 1 Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50222-250 50222-1	250 ml 1000 ml
A510, Type 2 Macroporous Strong Base Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Type 2 Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50223-250 50223-1	250 ml 1000 ml
A850, Type 1 Acrylic Strong Base Anion Resin **Polymer Structure**: Gel polyacrylic crosslinked with divinylbenzene **Functional Group**: Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50220-250 50220-1	250 ml 1000 ml
A860, Type 1 Macroporous Acrylic Strong Base Anion Resin **Polymer Structure**: Macroporous polyacrylic crosslinked with divinylbenzene **Functional Group**: Quaternary Ammonium **Ionic Form as Shipped**: Cl^-	50221-250 50221-1	250 ml 1000 ml

Weak Acid Cation Resin

Gel Type Polyacrylic Weak Acid Cation exchanger (WAC). Weak Acid Cation resins are increasingly being used in special applications including treatment of waste water streams in order to reduce environmental pollution.

C104Plus, High Capapcity Weak Acid Cation Resin **Polymer Structure**: Porous crosslinked polyacrylic **Functional Group**: Carboxylic Acid **Ionic Form as Shipped**: H^+	50217-250 50217-1	250 ml 1000 ml

	Catalog #	Size
Weak Base Anion Resins		
Macroporous weak base anion resins from Purolite have excellent mechanical, osmotic, and chemical stability, combined with the capability of very fast rates of ion exchange, making them particularly suitable for the removal of high molecular weight organic materials from aqueous solutions. The particle size range can also be specially designed to suit continuous process operation, or for operation at higher than average flow rates.		
A100, Weak Base Anion Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Tertiary Amine **Ionic Form as Shipped**: Free Base	50224-250 50224-1	250 ml 1000 ml
A830, High Capacity Weak Base Acrylic Anion Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Complex Amine **Ionic Form as Shipped**: Free Base	50226-250 50226-1	250 ml 1000 ml
A835, Weak Base Anion Exchange Resin **Polymer Structure**: Macroporous polystyrene crosslinked with divinylbenzene **Functional Group**: Tertiary Amine **Ionic Form as Shipped**: Free Base	50274-250 50274-1	250 ml 1 liter
A847, Weak Base Acrylic Anion Resin **Polymer Structure**: Gel polyacrylic crosslinked with divinylbenzene **Functional Group**: Tertiary Amine **Ionic Form as Shipped**: Free Base	50225-250 50225-1	250 ml 1000 ml
Amberlite® Resins		
Amberlite® 200 [12626-25-4] *H4g* For separation of rare earths, amino acids. Strong acid (sodium sulfonate), 0.49mm, capacity 1.7 meq/ml (wet). *Amberlite is a registered trademark of Rohm and Haas Co.*	15617-250	250 g
Amberlite® IR-120 Plus [9002-23-7] *H4g* For separation of rare earths, amino acids. Strong acid (sodium sulfonate), 0.5mm, capacity 1.9 meq/ml (wet).	04698-250	250 g
Amberlite® IR-122 For water conditioning. Strong acid (sodium sulfonate), 0.54mm, capacity 2.1 meq/ml (wet).	15626-250	250 g
Amberlite® IRA-458 For water conditioning. Strong base (quaternary ammonium chloride), 0.50mm, capacity 1.25 meq/ml (wet).	15629-250	250 g
Amberlite® IRA-900 For deionization of water and removal of organics. Strong base (quaternary ammonium chloride), 0.53mm, capacity 1.0 meq/ml (wet).	19522-250	250 g

	Catalog #	Size
Amberlite® IRA-93 [9036-92-4] *H2g* For dye waste decolorization, cyanide and silver removal. Weak base (free base), 0.49mm, capacity 1.2 meq/ml (wet).	15622-250	250 g
Amberlite® IRA-958 For removal of color, organics, and cyanide. Strong base (quaternary ammonium chloride), 0.49mm, capacity 0.8 meq/ml (wet).	15621-250	250 g
Amberlite IR-120 For separation of rare earths, amino acids. Strong acid (sodium sulfonate), 0.5mm, capacity 1.9 meq/ml (wet).	04714-250	250 g

Selectacel® Ion Exchange Cellulose Derivatives for Chromatography

Selectacel® ion exchangers are chemical derivatives of cellulose. These ion exchangers have been shown to be particularly effective in the fractionation of a variety of high molecular weight ionic substances including serum proteins, enzymes, and nucleic acids. Their ability to perform these separations is due to their functionality and the highly hydrophilic and porous nature of the cellulose lattice. These ion exchangers possess properties that are not approached by other resin exchangers currently available. Their capacity for proteins is high, and elution may be carried out under mild conditions which prevent denaturation.

Cellulose, carboxymethyl ether (Selectacel® CM, Standard) [9000-11-7] *H2g* **Standard Flow time(sec/10ml)**: 50 - 70, **Specific Volume(ml/g,wet)**: 10 - 14, **Capacity(Meq/g [±.1])**: 0.9	18631-100	100 g
Cellulose, epichlorohydrin/triethanolamine (Selectacel® ECTEOLA, Standard) [9015-13-8] *H2g* **Standard Flow time(sec/10ml)**: 100 - 150, **Specific Volume(ml/g,wet)**: 6 - 7.5, **Capacity(Meq/g [±.1])**: 0.3	18628-100	100 g
Cellulose, phosphate (Selectacel® phosphate) [9015-14-9] *H2g* **Standard Flow time(sec/10ml)**: 280 - 460, **Specific Volume(ml/g,wet)**: 5 - 6.5, **Capacity(Meq/g [±.1])**: 0.9	19792-100	100 g
Cellulose, phosphate (Selectacel® phosphate, standard, Type 40) *H6gh* **Standard Flow time(sec/10ml)**: 80 - 140 **Specific Volume(ml/g,wet)**: 7 - 12, **Capacity(Meq/g [±.1])**: 0.9	19793-100	100 g

Misc./Other

De-Hibit 200 [9003-70-7] *H2g* Resin for removal of phenolic inhibitors (hydroquinone monomethyl ether or t-butylcatechol) from neutral monomers, e.g., Methacrylate esters or styrene derivatives. Suitable for use with Inhibitor Removal Column, *(Cat. #19708)* Technical Data Sheet #256	24013-500	500 g
TMD-8 *A2g* Mixed bed resin (quaternary ammonium hydroxide/sulfonic acid), 16-50 mesh, capacity 0.55meq/ml (wet).	21445-250	250 g

Enzyme Carrier Resins (ECR)

Immobilized enzymes are powerful tools to optimize processes in both operative and economic terms. In addition to a more convenient handling of enzyme preparations, the two main targeted benefits of immobilized enzymes are 1) easy separation of the enzyme from the product, and 2) reuse of the enzyme. Immobilized enzymes allow the easy separation of the catalyst after the reaction e.g. filtration thereby reducing the costs of downstream processing. Moreover, the easy separation of the enzyme from the product simplifies enzyme applications and enables a reliable and efficient reaction technology. On the other hand, the reuse of immobilized enzymes provides cost advantages which are often an essential prerequisite for establishing an enzyme-catalyzed process in the first place. For more details, download the Enzyme Carrier Resins Product Guide from our web site.

Amine Functionalized

Another procedure for covalent immobilization of enzymes is based on the use of amino resins. Amino resins can be pre-activated by glutaraldehyde and then used in the covalent immobilization of enzymes (see Figure 4). Reaction of the aldehyde groups with amino groups of enzymes to form Schiff bases is fast and gives stable multipoint covalent binding. An even more stable linkage can be achieved by reduction with borohydrides.

	Catalog #	Size
ECR8305F, Amino C2 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50257-50 50257-250	50 g 250 g
ECR8305M, Amino C2 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50258-50 50258-250	50 g 250 g
ECR8309F, Amino C2 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50259-50 50259-250	50 g 250 g
ECR8309M, Amino C2 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50260-50 50260-250	50 g 250 g
ECR8404F, Amino C6 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50261-50 50261-250	50 g 250 g
ECR8404M, Amino C6 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50262-50 50262-250	50 g 250 g
ECR8409F, Amino C6 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50263-50 50263-250	50 g 250 g
ECR8409M, Amino C6 Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Amino	50264-50 50264-250	50 g 250 g

Epoxy Functionalized

Epoxy-activated resins are almost ideal matrices to perform easy immobilization of enzymes since they allow multipoint covalent binding between the enzyme and resin.

	Catalog #	Size
ECR8285M, Epoxy Methacrylate/Styrene Enzyme Carrier Resin Polymer Structure: Acrylic/styrene Functional Group: Epoxy	50252-50 50252-250	50 g 250 g
ECR8204F, Epoxy Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Epoxy	50253-50 50253-250	50 g 250 g
ECR8204M, Epoxy Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Epoxy	50254-50 50254-250	50 g 250 g
ECR8209F, Epoxy Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Epoxy	50255-50 50255-250	50 g 250 g
ECR8209M, Epoxy Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Epoxy	50256-50 50256-250	50 g 250 g

Resins for Enzyme Adsorption

This method for the immobilization of enzymes is based on the physical adsorption of enzyme protein on the surface of water-insoluble carriers. The method is very gentle and causes little or no conformational change of the enzyme or destruction of its active center. This method is particularly suitable for applications in organic solvents or hydrophobic media such oils. A major advantage of adsorption as a general method of immobilizing enzymes is that usually no reagents are required.

ECR1090F, Macroporous Styrene Enzyme Carrier Resin Polymer Structure: Styrene	50245-50 50245-250	50 g 250 g
ECR1090M, Macroporous Styrene Enzyme Carrier Resin Polymer Structure: Styrene	50246-50 50246-250	50 g 250 g
ECR1091F, Macroporous Styrene Enzyme Carrier Resin Polymer Structure: Styrene	50247-50 50247-250	50 g 250 g
ECR1091M, Macroporous Styrene Enzyme Carrier Resin Polymer Structure: Styrene	50248-50 50248-250	50 g 250 g
ECR8804F, Octadecyl Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Octadecyl	50265-50 50265-250	50 g 250 g

	Catalog #	Size
ECR8804M, Octadecyl Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Octadecyl	50266-50 50266-250	50 g 250 g
ECR8806F, Octadecyl Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Octadecyl	50267-50 50267-250	50 g 250 g
ECR8806M, Octadecyl Methacrylate Enzyme Carrier Resin Polymer Structure: Acrylic Functional Group: Octadecyl	50268-50 50268-250	50 g 250 g

Enzyme Resin Carrier Kits

Each kit contains 50 g of each Enzyme Resin Carrier

PolyLink Amine Linker Kit - F50 • ECR8310F Amino C2 Methacrylate *(Cat. #50257)* • ECR8319F Amino C2 Methacrylate *(Cat. #50259)* • ECR8405F Amino C6 Methacrylate *(Cat. #50261)* • ECR8417F Amino C6 Methacrylate *(Cat. #50263)*	50269-1	1 kit
PolyLink Amine Linker Kit with Columns and Reagents for Enzyme Immobilization • ECR8310F Amino C2 Methacrylate *(Cat. #50275A)* • ECR8319F Amino C2 Methacrylate *(Cat. #50275B)* • ECR8405F Amino C2 Methacrylate *(Cat. #50275C)* • ECR8417F Amino C2 Methacrylate *(Cat. #50275D)* • Glutaraldehyde 25% in Ampules (10 mL) *(Cat. #01909A)* • Glutaraldehyde 8% in PBS (empty labeled bottle) *(Cat. #19540B)* • Phosphate Buffer saline (225 mL) *(Cat. #19540A*	50275-1	1 kit
PolyLink Enzyme Adsorption Kit - F50 • ECR8804F Octadecyl Methacrylate *(Cat. #50265)* • ECR8806F Octadecyl Methacrylate *(Cat. #50267)* • ECR1090F Macroporous Styrene *(Cat. #50245)* • ECR1091F Macroporous Styrene *(Cat. #50247)*	50271-1	1 kit
PolyLink Enzyme Linker Kit - F50 • ECR8285M Epoxy Methacrylate/Styrene *(Cat. #50252)* • ECR8214F Epoxy Methacrylate *(Cat. #50255)* • ECR8405F Amino C6 Methacrylate *(Cat. #50261)* • ECR8804F Octadecyl Methacrylate *(Cat. #50265)* • ECR1090F Macroporous Styrene *(Cat. #50245)*	50273-1	1 kit
PolyLink Epoxy Linker Kit - F50 • ECR8205 Epoxy Methacrylate *(Cat. #50253)* • ECR8214 Epoxy Methacrylate *(Cat. #50255)* • ECR8285M Epoxy Methacrylate/Styrene *(Cat. #50252)*	50270-1	1 kit

	Catalog #	Size
PolyLink Epoxy Linker Kit with Columns and Reagents for Enzyme Immobilization . . . • ECR8205F Epoxy Methacrylate *(Cat. #50279A)* • ECR8214F Epoxy Methacrylate *(Cat. #50279B)* • ECR8204F Epoxy Methacrylate *(Cat. #50279C)* • Phosphate buffered saline (225 mL) *(Cat. #01954A)* • Phosphate buffered solution pH 8, 1.0 M (200 mL) *(Cat. #50279D)*	50279-1	1 kit
PolyLink Lipase Linker Kit - F50 . . . . . . • ECR8285M Epoxy Methacrylate/Styrene *(Cat. #50252)* • ECR8804F Octadecyl Methacrylate *(Cat. #50265)* • ECR8806F Octadecyl Methacrylate *(Cat. #50267)* • ECR1090F Macroporous Styrene *(Cat. #50245)*	50272-1	1 kit

Ion Exchange Resin Cartridges

High quality of cartridge components and precision manufacturing techniques, allow us to provide you with the highest quality, best performing Ion Exchange Resin Cartridges. We offer cartridges in many configurations such as Barnstead, Millipore, and US Filter to fit most popular ultra-pure water systems.

Purolite® Ion Exchange Resin Cartridges are made from virgin polypropylene, using the latest heat welding techniques without using any chemical bonding agents. Assembly is performed under clean manufacturing conditions using proven statistical Process Control to ensure product quality. Model and lot numbers are heat stamped into each cartridge to provide traceability without the concern of possible contamination from ink or labels. For more details on Ion Exchange Resin Cartridges, please visit our web site and download the Product Guide available at: www.polysciences/cartridges.

Ametek - SlimLine Style Cartridges

Length: 9.8125" (24.9 cm) **Diameter**: 2.923" (7.42 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-2010 Cartridge . . . . . . **Style**: Cartridge - Ametek/Continental **Replaces**: Continental Model DISB 1000-4	50146-1 50146-4	1 Unit 4 Pack
PCL-2011 Cartridge . . . . . . **Style**: Cartridge - Ametek/Continental **Replaces**: Continental /Ametek Model DIMN 1000-4 / PCF1-10MB	50148-1 50148-4	1 Unit 4 Pack
PCL-2013 Cartridge . . . . . . **Style**: Cartridge - Ametek/Continental **Replaces**: Continental /Ametek Model DIMN 1000-4 / PCF1-10MB	50150-1 50150-4	1 Unit 4 Pack
PCL-2015 Cartridge . . . . . . **Replaces**: Continental Model DIOR 1000-4	50151-1 50151-4	1 Unit 4 Pack
PCL-2019 Cartridge . . . . . . **Replaces**: Continental 10" Mixed Bed Oxygen Removal	50152-4	4 Pack

	Catalog #	Size
PCL-2022 Cartridge **Replaces**: Continental Model DIMS 1000	50154-1	1 Unit
PCL-2023 Cartridge **Replaces**: Continental 10″ Oxygen / Organic Removal	50155-4	4 Pack

Ametek/Continental - 10″ Big Blue Style Cartridges

Length: 9.8″ (24.9 cm) **Diameter**: 4.5″ (11.43 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-2211 Cartridge **Replaces**: Continental 10″ Big Blue Mixed Bed	50168-1 50168-2	1 Unit 2 Pack
PCL-2213 Cartridge **Replaces**: Continental 10″ Big Blue Carbon	50169-1 50169-2	1 Unit 2 Pack
PCL-2215 Cartridge **Replaces**: Continental 10″ Big Blue Organic Scavenger	50170-1 50170-2	1 Unit 2 Pack

Ametek/Continental - 20″ Big Blue Style Cartridges

Length: 20″ (50.8 cm) **Diameter**: 4.5″ (11.43 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-2311 Cartridge **Replaces**: Ametek Model BBF1-20MB	50171-1	1 Unit
PCL-2313 Cartridge **Replaces**: Continental 20″ Big Blue Carbon	50172-1	1 Unit
PCL-2315 Cartridge **Replaces**: Continental 20″ Big Blue Organic Scavenger	50173-1	1 Unit
PCL-2316 Cartridge **Replaces**: Continental 20″ Big Blue High Temperature Mixed	50174-1	1 Unit
PCL-2318 Cartridge **Replaces**: Continental 20″ Big Blue Anion Regenerated	50175-1	1 Unit
PCL-2340 Cartridge **Replaces**: Continental 20″ Big Blue Boron Removal	50176-1	1 Unit
PCL-2511 Cartridge **Replaces**: Continental 20″ Big Blue Iodine Resin Cartridge	50178-1	1 Unit

Ametek/Continental - Misc. Cartridges

	Catalog #	Size
PCL-2010 U Cartridge **Style**: Cartridge - Big Blue - Ametek **Replaces**: Continental 10″ Seperate Bed Upflow	50147-4	4 Pack
PCL-2011 THD Cartridge **Replaces**: Continental 10″ Mixed Bed Threaded	50149-4	4 Pack
PCL-2020 S Cartridge **Style**: Cartridge - Big Blue - Ametek **Replaces**: Continental 10″ Cartridge (single) Oxygen Removal	50153-1	1 Pack
PCL-2024 S Cartridge **Style**: Cartridge - Big Blue - Ametek **Replaces**: Continental 10″ MN-500	50156-1	1 Unit
PCL-2110 U Cartridge **Replaces**: Continental 20″ Seperate Bed Upflow	50158-1 50158-2	1 Unit 2 Pack
PCL-2111 THD Cartridge **Replaces**: Continental 20″ Mixed Bed Threaded	50160-1 50160-2	1 Unit 2 Pack
PCL-2411 Cartridge **Style**: Cartridge - Big Blue - Ametek **Replaces**: Continental 5″ Ultra Pure Mixed Bed	50177-4	4 Pack

Ametek/Continental - SlimLine Style Cartridges

Length: 20″ (50.8 cm) **Diameter**: 2.923″ (7.42 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-2110 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental Model DISB 2000-2	50157-1 50157-2	1 Unit 2 Pack
PCL-2111 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental/Ametek Model DIMN 2000-2 / PCF-20MB	50159-1 50159-2	1 Unit 2 Pack
PCL-2113 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental Model DICR 2000-2	50161-1 50161-2	1 Unit 2 Pack
PCL-2115 Cartridge **Replaces**: Continental Model DIOR 2000-2	50162-1 50162-2	1 Unit 2 Pack

	Catalog #	Size
PCL-2119 Cartridge **Replaces**: Continental 20″ Seperate Bed	50163-1 50163-2	1 Unit 2 Pack
PCL-2120 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental 20″ Oxygen Removal	50164-2	2 Pack
PCL-2121 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental 20″ Cation Regenerated	50165-2	2 Pack
PCL-2124 Cartridge **Style**: Cartridge - Ametek/Continental **Replaces**: Continental 20″ MN-500	50166-1	1 Unit
PCL-2131 Cartridge **Replaces**: Continental 20″ Anion Regenerated	50167-2	2 Pack

Barnstead - Final Filtration Cartridges

Inlet: 0.25″ NPT **Outlet**: Variable Hose Barb **Maximum Flow Rate**: 2 liters/min
Maximum Inlet Pressure: 50 PSI

PCL-1450 Cartridge **Replaces**: Barnstead Model D3750	50128-1	1 Unit

Barnstead - Hose Barb Style Cartridges

Length: 18.7″ (47.5 cm) **Diameter**: 3.4″ (8.6 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-11-A860Cl Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Tannin Removal	50124-1	1 Unit
PCL-11-S920 Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Chelating	50125-1	1 Unit
PCL-1110D Cartridge **Replaces**: Barnstead Model D8901	50114-1	1 Unit
PCL-1111 Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8911	50115-1	1 Unit
PCL-1111D Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8902	50116-1	1 Unit

	Catalog #	Size
PCL-1112 Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8903	50117-1	1 Unit
PCL-1113 Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8904	50118-1	1 Unit
PCL-1114D Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8905	50119-1	1 Unit
PCL-1116D Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Model D8921	50120-1	1 Unit
PCL-1117D Cartridge **Replaces**: Barnstead Model D8922	50121-1	1 Unit
PCL-1121 Cartridge **Style**: Hose Barb Cartridge **Replaces**: Barnstead Anion Removal	50122-1	1 Unit
PCL-1310D Cartridge **Replaces**: Barnstead Model D8950	50126-1	1 Unit
PCL-1317D Cartridge **Replaces**: Barnstead Model D8951	50127-1	1 Unit
PCL-1919 Cartridge **Replaces**: Barnstead Model D8822	50145-1	1 Unit

Barnstead - PCS-Style Cartridges

Length: 17.2″ (43.7 cm) **Diameter**: 3.4″ (8.6 cm) **Maximum Differential Pressure**: 60 psi
Recommended Storage Temperature: 0° – 35° C

PCL-1010 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0803	50100-1	1 Unit
PCL-1011 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0809, D5027	50101-1	1 Unit
PCL-1012 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0811	50102-1	1 Unit

	Catalog #	Size
PCL-1013 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0813	50103-1	1 Unit
PCL-1014 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0815	50104-1	1 Unit
PCL-1015 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0820	50105-1	1 Unit
PCL-1016 Cartridge **Replaces**: Barnstead Model D0832	50106-1	1Unit
PCL-1017 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0835	50107-1	1 Unit
PCL-1018 Cartridge **Replaces**: Barnstead Model D0836	50108-1	1 Unit
PCL-1019 Cartridge **Replaces**: Barnstead Model D8809	50109-1	1 Unit
PCL-1020 Cartridge **Replaces**: Barnstead Model D08811	50110-1	1 Unit
PCL-1021 Cartridge **Style**: PCS Cartridge **Replaces**: Barnstead Model D0760	50111-1	1 Unit
PCL-1022 Cartridge **Replaces**: Barnstead Model D5021	50112-1	1 Unit

Barnstead Kits

PCL-1530 Cartridge **Style**: Kit-Barnstead **Replaces**: Barnstead Model D5029	50129-1	1 Unit
PCL-1531 Cartridge **Replaces**: Barnstead Model D5022	50130-1	1 Unit
PCL-1532 Cartridge **Style**: Kit-Barnstead **Replaces**: Barnstead Model D5028	50131-1	1 Unit

	Catalog #	Size
PCL-1533 Cartridge **Replaces**: Barnstead Model D5023	50132-1	1 Unit
PCL-1534 Cartridge **Replaces**: Barnstead Model D50227	50133-1	1 Unit
PCL-1535 Cartridge **Replaces**: Barnstead Model D50228	50134-1	1 Unit
PCL-1630 Cartridge **Replaces**: Barnstead Model D3805	50135-1	1 Unit
PCL-1631 Cartridge **Replaces**: Barnstead Model D3806	50136-1	1 Unit
PCL-1632 Cartridge **Replaces**: Barnstead Model D3804	50137-1	1 Unit
PCL-1633 Cartridge **Replaces**: Barnstead Model D3807	50138-1	1 Unit
PCL-1732 Cartridge **Replaces**: Barnstead Model D4801	50139-1	1 Unit
PCL-1733 Cartridge **Replaces**: Barnstead Model D4802	50140-1	1 Unit
PCL-1734 Cartridge **Style**: Kit-Barnstead **Replaces**: Barnstead Model D5025	50141-1	1 Unit
PCL-1735 Cartridge **Style**: Kit-Barnstead **Replaces**: Barnstead Model D5026	50142-1	1 Unit

Hose Barb Style Cartridges - Custom

PCL-1124 Cartridge **Style**: Hose Barb Cartridge **Replaces**: No Equivalent Model	50123-1	1 Unit
PCL-1911 Cartridge **Replaces**: No Equivalent Model	50143-1	1 Unit
PCL-1913 Cartridge **Style**: Hose Barb Cartridge **Replaces**: No Equivalent Model	50144-1	1 Unit

	Catalog #	Size
Millipore® - Misc. Cartridges		
PCL-5011 L Cartridge Cartridge type: Milli-Q Ultra Pure Mixed Bed	50180-1	1 Unit
PCL-6225 Cartridge Replaces: Millipore Model PROG000S1	50206-1	1 Unit
PCL-6215 Cartridge Replaces: Millipore Model PROG000S2	50207-1	1 Unit
Millipore® Double Open-end Cartridge with Single 222 O-Rings		
Length: 17.2" (43.7 cm) Diameter: 3.4" (8.6 cm) Maximum Differential Pressure: 60 psi Recommended Storage Temperature: 0° – 35° C		
PCL-5111 Cartridge Style: Millipore Replaces: Millipore Model CDMB 022 02	50183-1	1 Unit
PCL-5113 Cartridge Style: Millipore Replaces: Millipore Model CDFC 022 03	50184-1	1 Unit
PCL-5116 Cartridge Style: Millipore Replaces: Millipore Model CDEX 022 01	50185-1	1 Unit
PCL-5119 Cartridge Style: Millipore	50186-1	1 Unit
Millipore® Double Open-end Cartridge with Double 222 O-Rings		
Length: 17.2" (43.7 cm) Diameter: 3.4" (8.6 cm) Maximum Differential Pressure: 60 psi Recommended Storage Temperature: 0° – 35° C		
PCL-5011 Cartridge Style: Millipore Replaces: Millipore Model CPMB 012 02	50179-1	1 Unit
PCL-5013 Cartridge Style: Millipore Replaces: Millipore Model CDFC 012 04	50181-1	1 Unit
PCL-5016 Cartridge Style: Millipore Replaces: Millipore Model CDEX 012 01	50182-1	1 Unit

	Catalog #	Size
Millipore® Filters		
PCL-5060 Cartridge **Style**: Filter-Millipore **Replaces**: Millipore Model CWSC 01T P3	50187-1	1 Unit
PCL-5061 Cartridge **Style**: Filter-Millipore **Replaces**: Millipore Model MPGL-04S K2	50188-1	1 Unit
Millipore® Kits		
PCL-5536 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CDMF 012 04	50195-1	1 Unit
PCL-5537 Cartridge **Replaces**: Millipore Model CDMF 012 05	50196-1	1 Unit
PCL-5538 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CDOF 012 05	50197-1	1 Unit
PCL-6120 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QGARDD00R1	50202-1	1 Unit
PCL-6110 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QGARDD00D2	50201-1	1 Unit
PCL-6130 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QGARD0OVX	50203-1	1 Unit
PCL-6220 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model PROG00001	50205-1	1 Unit
PCL-6210 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model PROG00002	50204-1	1 Unit
PCL-6310 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QTUMOOEX	50208-1	1 Unit
PCL-6320 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QTUM00OIX	50209-1	1 Unit

	Catalog #	Size
PCL-6330 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QTUM00OVX	50210-1	1 Unit
PCL-6340 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model QTUM00ICP	50211-1	1 Unit

Millipore® QPAK System Cartridges

Maximum Differential Pressure: 60 PSI **Recommended Storage Temperature**: 0° – 35° C

PCL-5450 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CPMQ 004 R1	50189-1	1 Unit
PCL-5451 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CPMQ K05 R1	50190-1	1 Unit
PCL-5452 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model DPMQ 004 D2	50191-1	1 Unit
PCL-5453 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CPMQ K05 D2	50192-1	1 Unit
PCL-5454 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CPRO P04 02	50193-1	1 Unit
PCL-5455 Cartridge **Style**: Kit-Millipore **Replaces**: Millipore Model CP4A LLR ES	50194-1	1 Unit

PCS Style Cartridges - Custom

PCL-1023 Cartridge **Style**: PCS Cartridge **Replaces**: No Equivalent Model	50113-1	1 Unit

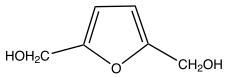
	Catalog #	Size

Organic Intermediates & Specialties

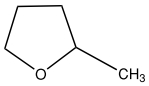
Furan Based Organic Blocks

Furan based synthons are finding new uses in organic and polymer synthesis applications including the pharmaceutical, flavors & fragrances, graphic arts and organic intermediate industries.

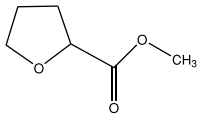
Bis-(hydroxymethyl) Furan [1883-75-6] *U4d* . . . . . 24723-10 10 g
$C_6H_8O_3$
2,5 Position Disubstituted Furan.
Application: Specialty Diol



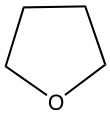
2-Methyl Tetrahydrofuran [96-47-9] *CH4g* . . . . . 24707-1000 100 g
MW 86.13 mp -136°C bp 80°C -11.1
Solubility in water w(g/100 g at 25°C): 13. TSCA
$C_5H_{10}O$
2 Position Substituted Furan.
Applications: Grignard Solvent, Organometallic Chemistry, Extraction Solvent, Dichloromethane replacement solvent.



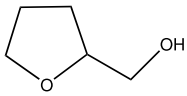
2-Methyl Tetrahydrofuroate [37443-42-8] *EH4g* . . . . . 24726-25 25 g
bp 76°C (169°F) 64°C (147°F)
Soluble in water (g/100 g at 25°C): miscible.
$C_6H_{10}O_3$
2 Position Substituted Furan.
Applications: Synthetic intermediate for pharmaceuticals.



Tetrahydrofuran [109-99-9] *CH4g* . . . . . 24752-500 500 g
MW 72.11 mp -108°C bp 65-67°C d 0.889 g/ml Appearance: liquid
C_4H_8O



Tetrahydrofurfuryl Alcohol [97-99-4] *EH4g* . . . . . 24714-250 250 g
MW 102.13 mp -80°C bp 178°C 183°F
Soluble in water (g/100 g at 20°C): miscible. TSCA
$C_5H_{10}O_2$
Applications: Agricultural "green" solvent or adjuvant, Electronics Cleaner, Printing inks, Reactive diluent for epoxy resins, Industrial Cleaner/Paint Stripper, Pharmaceutical intermediate.

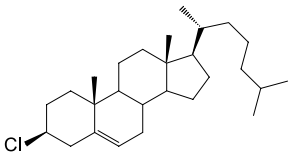


	Catalog #	Size

Organic Specialties - Liquid Crystals

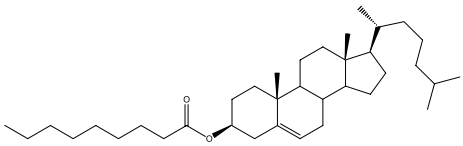
Organic compounds that are capable of responding to small amounts of radiant energy and undergo a phase transition with selective reflection of light. Specific colors are obtained depending on the wavelength of light which is determined by the organic crystal array "pitch length." Pitch lengths will vary considerably depending on temperature and the reflected light will also therefore depend on temperature. Application areas range from thermally activated displays to sensors and detection devices to cosmetics.

Cholesteryl Chloride [910-31-6] *HU4g* . . . . . 24814-50 50 g
(3β-chloro-5-cholestene) Appearance: White Solid
Applications: Thermally Activated Displays, Sensors and Detection Devices, Cosmetics.



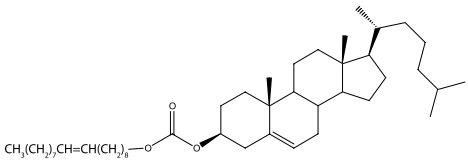
Transition Temperature:
- Crystal - isotropic state at 96-98° C
- On cooling isotropic - cholesteric at 95° C
- Cholesteric - crystal 64° C

Cholesteryl Nonanoate [1182-66-7] *HU4g* . . . . . 24817-50 50 g
(5-cholestene-3β-ol nonanoate)
Appearance: White, free flowing powder
Applications: Thermally Activated Displays, Sensors and Detection Devices, Cosmetics.



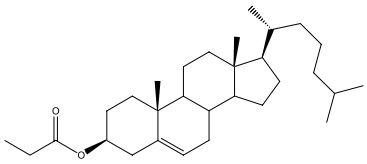
Transition Temperature:
- Crystal - smectic at 77.5° C
- Smectic - cholesteric 79° C
- Cholesteric - isotropic 90° C

Cholesteryl Oleyl Carbonate [17110-51-9] *HU4g* . . . . . 24815-50 50 g
(3-cholestene-3β-ol oleyl carbonate)
Appearance: Hazy semi-solid to viscous liquid
Applications: Thermally Activated Displays, Sensors and Detection Devices, Cosmetics.



Transition Temperature:
- Crystal - isotropic state at 20° C
- On cholesteric - isotropic at 40° C
- Normally in smectic phase but will slowly crystallize to a solid.

Cholesteryl Propionate [633-31-8] *HU4g* . . . . . 24816-50 50 g
(5-cholestene-3β-ol propionate)
Appearance: White, free flowing powder
Applications: Thermally Activated Displays, Sensors and Detection Devices, Cosmetics.

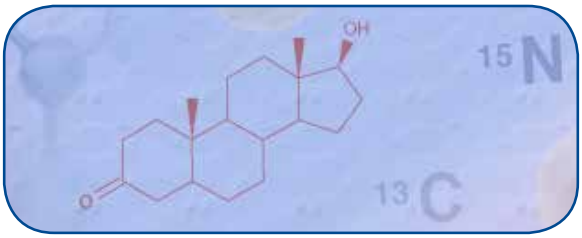


Transition Temperature:
- Crystal - cholesteric state at 96° C
- Cholesteric - isotropic 112° C

Stable Isotope Labeled Compounds

Polysciences provides over 200 stable isotope labeled compounds for use as mass spectroscopy internal standards and for obtaining clearer results when analyzing NMR samples including:

- Final Drug Substances and Intermediates
- Vitamin Standards
- Steroid Standards
- Caffeine and Xanthine Standards
- Environmental Standards
- Biological Standards
- Standards and Precursors for PET
- Custom Synthesis

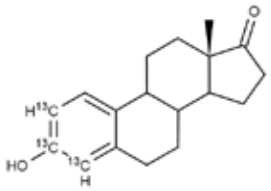


This catalog includes many hard to find stable isotope labeled compounds useful for both the research and analysis communities. Many of these compounds can also be provided in larger quantities than those listed in the catalog, so please inquire for pricing and availability. We can also provide custom synthesized, labeled versions of nearly any compound that you may need as well as custom versions of our catalog compounds with different substitution patterns or additional labeled atoms.

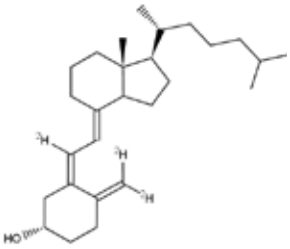
For convenience many of our more popular compounds are also available as exact concentration solutions. These **[Exact]² Solutions™** with both exact known mass and concentration provide the most convenient method to quickly add a known amount of internal standard to your samples prior to analysis.

[Exact]² Solutions™ Reference Standard Solutions

- Exact mass Vitamin & Steroid solutions available
- Exact concentration determined for each lot
- Ready to use 1 mL solutions in sealed ampules
  - No need to weigh samples
  - No need to dilute solutions
- Increased vitamin stability
- Lower cost
- Less waste



25226
Estrone-[2,3,4-$^{13}C_3$]



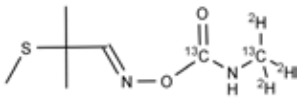
25124
Vitamin-D3-[$^{2}H_3$]

Stable Isotope Compounds

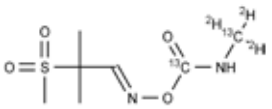
We provide over 200 stable isotope labeled compounds for use as mass spectroscopy internal standards and for obtaining clearer results when analyzing NMR samples, including many hard to find stable isotope labeled compounds useful for both research and analytical communities. Many of these compounds can also be provided in larger quantities than those listed in the catalog. Please inquire for pricing and availability. We can also provide custom synthesized, labeled versions of nearly any compound that you may need as well as custom versions of our catalog compounds with different substitution patterns or additional labeled atoms. Where applicable labeled and unlabeled CAS numbers are provided. **All stable isotopes require overnight shipping methods.**

	Catalog #	Size
2-Flouro-5-iodoaniline-[13C6] [886362-82-9] *af*	25232-1	1 g
MW 242.96941 C_6H_5FIN **Isotopic Incorporation**: >99% 13C **Purity**: ≥98% **Shipping**: Overnight		
3-Nitroaniline-[13C6] [1261170-88-0; unlabeled: 99-09-2] *af*	25279-1	1 g
MW 144.08 $C_6HN_2O_{2</sub}$ **Isotopic Incorporation**: 99% 13C **Purity**: ≥95% **Shipping**: Overnight		
4-Flouriodobenzene-[13C6] [352-34-1] *af*	25233-1	1 g
MW 227.95476 C_6H_4FI **Isotopic Incorporation**: >99% 13C **Purity**: ≥98% **Shipping**: Overnight		
5-Acetylamino-6-amino-3-methyluracil-[13C4,15N3] [1173022-65-5; unlabeled: 19893-78-8] *A2af* . .	25129-1	1 mg
MW 205.13 $C_7H_{10}N_4O_3$ **Isotopic Incorporation**: 99% 13C; 98% 15N (M+6.95) Purity: ≥98%	25129-2 25129-5	2 mg 5 mg

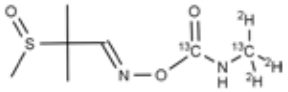
	Catalog #	Size
Aldicarb-[13C3,2H3] [1261170-75-5; unlabeled: 116-06-3] *HPS3af*	25130-1	1 mg
MW 195.2669	25130-5	5 mg
$C_7H_{14}N_2O_2S$	25130-10	10 mg
Isotopic Incorporation: 99% 13C; 98% 2H. Purity: ≥98%	25130-25	25 mg



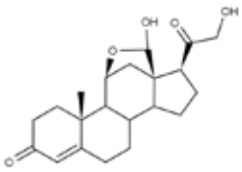
Aldicarb sulfone-[13C3,2H3] [1261170-76-6; unlabeled:1646-88-4] *PSW3af*	25131-1	1 mg
MW 227.26	25131-5	5 mg
$C_7H_{14}N_2O_4S$	25131-10	10 mg
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%	25131-25	25 mg



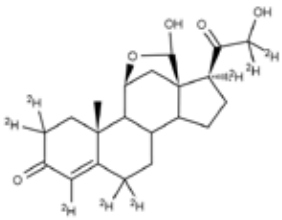
Aldicarb sulfoxide-[13C3,2H3] [1261170-77-7; unlabeled: 1646-87-3] *PSW3af*	25132-1	1 mg
MW 211.266	25132-5	5 mg
$C_7H_{14}N_2O_3S$	25132-10	10 mg
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%	25132-25	25 mg



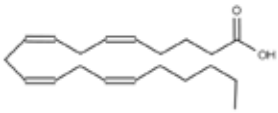
Aldosterone [52-39-1] *HM3af*	25134-1	1 mg
MW 360.444	25134-5	5 mg
$C_{21}H_{28}O_5$		
Purity: ≥95%		



Aldosterone-[2,2,4,6,6,17,21,21-2H8] [1261254-31-2; unlabeled: 52-39-1] *HM3af*	25133-1	1 mg
MW 368.4932	25133-2	2 mg
$C_{21}H_{28}O_5$	25133-5	5 mg
Isotopic Incorporation: ≥6 D/molecule. Purity: ≥98%	25133-10	10 mg

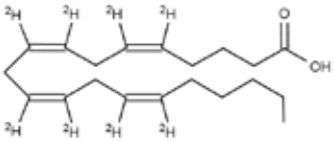


Arachidonic acid [506-32-1] *HK3abf*	25140-1	1 mg
MW 304.4668	25140-5	5 mg
$C_{20}H_{32}O_2$	25140-10	10 mg
Purity: >95%		

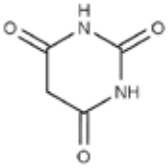


	Catalog #	Size
Arachidonic acid-[5,6,8,9,11,12,14,15-2H8] [69254-37-1; unlabeled: 506-32-1] *HK3abf*	25139-5	1 mg
	25139-10	10 mg
	25139-50	50 mg
	25139-100	100 mg
Barbituric Acid [67-52-7] *H3af*	25142-1	1 g
	25142-5	5 mg
	25142-10	10 mg
Barbituric Acid-[13C4,15N2] [1173019-05-0; unlabeled: 67-52-7] *H3af*	25141-5	5 mg
	25141-10	10 mg
Biotin [58-85-5] *H3af*	25145-1	1 mg
	25145-5	5 mg
Biotin-[2H2] [1217481-41-8; unlabeled: 58-85-5] *H3af*	25143-5	5 mg
	25143-10	10 mg
	25143-20	20 mg
Biotin-[2H2]; ethanol solution (1mL) [1217481-41-8; unlabeled: 58-85-5] *CH5af*	25146-0.05	50 µg/ml
	25146-0.1	100 µg/ml

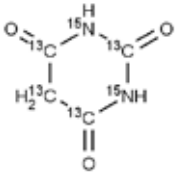
Arachidonic acid-[5,6,8,9,11,12,14,15-2H8] [69254-37-1; unlabeled: 506-32-1] *HK3abf*
MW 312.516
$C_{20}H_{32}O_2$
Isotopic Incorporation: 7.45 D/molecule; >99% isotopic distribution between D5 and D10. Purity: ≥98%



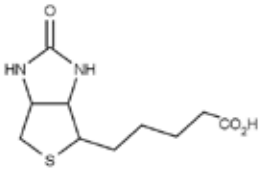
Barbituric Acid [67-52-7] *H3af*
MW 128.086
$C_4H_4N_2O_3$
Purity: ≥98%



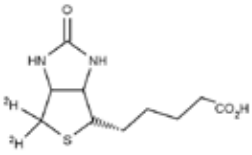
Barbituric Acid-[13C4,15N2] [1173019-05-0; unlabeled: 67-52-7] *H3af*
MW 134.04
$C_4H_4N_2O_3$
Isotopic Incorporation: 99% 13C; 98% 15N. Purity: ≥97%



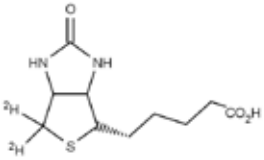
Biotin [58-85-5] *H3af*
MW 244.31
$C_{10}H_{16}N_2O_3S$
Purity: ≥98%



Biotin-[2H2] [1217481-41-8; unlabeled: 58-85-5] *H3af*
MW 246.32
$C_{10}H_{16}N_2O_3S$
Isotopic Incorporation: ≥98% 2H. Purity: ≥97%

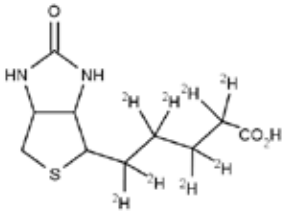


Biotin-[2H2]; ethanol solution (1mL) [1217481-41-8; unlabeled: 58-85-5] *CH5af*
MW 246.323
$C_{10}H_{16}N_2O_3S$
Isotopic Incorporation: ≥98% 2H. Purity: ≥97%



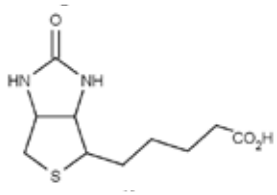
	Catalog #	Size
Biotin-[2H8] [1261170-78-8; unlabeled: 58-85-5] *H3af*	25144-1	1 mg
	25144-5	5 mg

MW 252.36
$C_{10}H_{16}N_2O_3S$
Isotopic Incorporation: ≥99% 2H. Purity: ≥98%



Biotin; ethanol solution (1mL) [58-85-5] *CH5af*	25148-0.05	50 µg/ml
	25148-0.1	100 µg/ml

MW 244.311
$C_{10}H_{16}N_2O_3S$
Purity: ≥98%

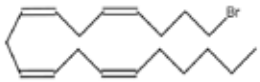


Z-1-Bromoheneicosa-3,6,9,12,15,18-hexaene [147544-57-8] *A3af*	25153-1	1 g
	25153-2	2 g

MW 363.375
$C_{21}H_{31}Br$
Purity: ≥95% (major contaminant is 1-chloro)

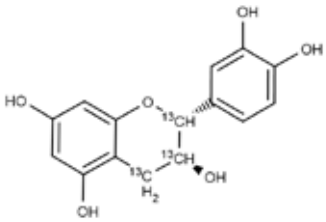
Z-1-Bromononadeca-4,7,10,13-tetraene [117567-53-0] *A3af*	25156-1	1 g
	25156-2	2 g

MW 339.3529
$C_{19}H_{31}Br$
Purity: ≥95% (major contaminant is 1-chloro)



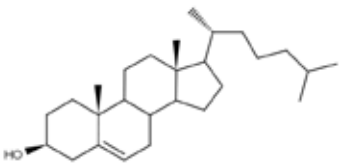
(+/-)-Catechin-[13C3] [1261254-33-4; unlabeled: 7295-85-4] *H3af*	25157-1	1 mg
	25157-5	5 mg

MW 293.246
$C_{15}H_{14}O_6$
Isotopic Incorporation: >99% 13C Purity: ≥98%



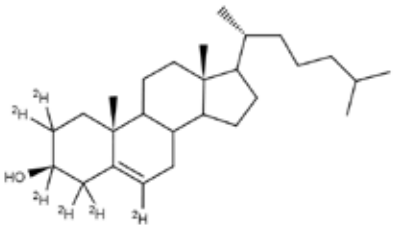
Cholesterol [57-88-5] *H3af*	25159-1	1 mg
	25159-5	5 mg
	25159-10	10 mg

MW 386.6535
$C_{27}H_{46}O$
Purity: ≥98%

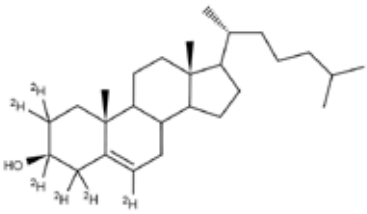


	Catalog #	Size
Cholesterol-[2,2,3,4,4,6-2H6] [92543-08-3 Unlabeled: 57-88-5] *H3af*	25158-25	25 mg
	25158-50	50 mg
	25158-100	100 mg
	25158-500	500 mg
Cholesterol-[2,2,3,4,4,6-2H6]; chloroform solution (1 mL) [92543-07-2; unlabeled: 57-88-5] *C3af*	25160-0.1	100 µg/ml
	25160-1	1 mg/ml
Cholesterol; chloroform solution (1 mL) [57-88-5] *C3af*	25161-0.1	100 µg/ml
	25161-1	1 mg/ml
Choline-1,1,2,2-d4 bromide [1927-06-6]	25384-100	100 mg
	25384-500	500 mg
Cortisol [50-23-7] *H3af*	25166-1	1 mg
	25166-5	5 mg
	25166-10	10 mg
Cortisol-[2H4] [73565-87-4; unlabeled: 50-23-7] *H3af*	25165-5	5 mg
	25165-10	10 mg

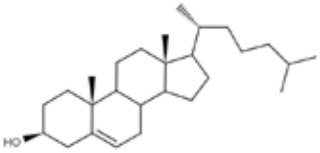
MW 392.6904
$C_{27}H_{46}O$
Isotopic Incorporation: >99% 2H Purity: ≥98%



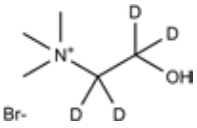
MW 392.69049
$C_{27}H_{46}O$
Isotopic Incorporation: >99% 2H Purity: ≥98%



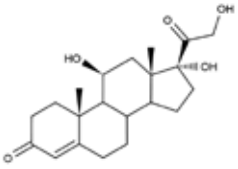
MW 386.6535
$C_{27}H_{46}O$
Purity: ≥98%



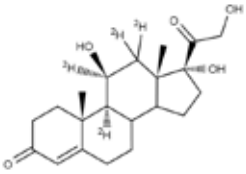
MW 188.1 Appearance: Solid
$C_5H_{10}D_4BrNO$



MW 362.4598
$C_{21}H_{30}O_5$
Purity: ≥98%

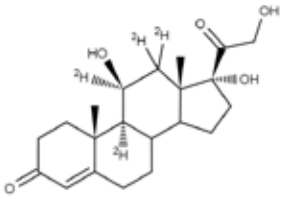


MW 366.4844
$C_{21}H_{30}O_5$
Isotopic Incorporation: 98% 2H Purity: ≥98%



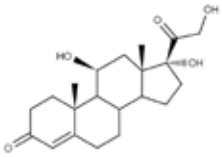
	Catalog #	Size
Cortisol-[2H4]; methanol solution (1 mL) [73565-87-4; unlabeled: 50-23-7] *CHP7af*	25167-0.1	100 µg/ml
	25167-1	1 mg/ml

MW 366.4845
$C_{21}H_{30}O_5$
Isotopic Incorporation: 98% 2H Purity: ≥98%



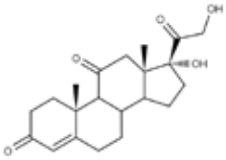
Cortisol; methanol solution (1 mL) [50-23-7] *CHP7af*	25168-0.1	100 µg/ml
	25168-1	1 mg/ml

MW 362.4599
$C_{21}H_{30}O_5$
Purity: ≥98%



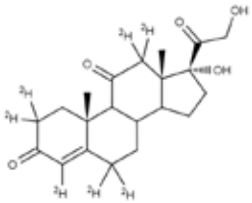
Cortisone [53-06-5] *H3af*	25170-1	1 mg
	25170-5	5 mg
	25170-10	10 mg

MW 360.444
$C_{21}H_{28}O_5$
Purity: ≥98%



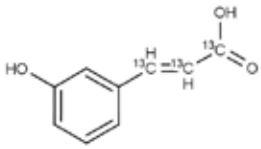
Cortisone-[2H7] [1261254-36-7; unlabeled:53-06-5] *H3af*	25169-1	1 mg
	25169-5	5 mg
	25169-10	10 mg

MW 367.4872
$C_{21}H_{28}O_5$
Isotopic Incorporation: 98% 2H Purity: ≥98%



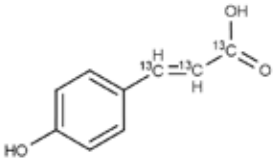
m-Coumaric acid-[13C3] [1261170-79-9] *H3af*	25171-1	1 mg
	25171-5	5 mg

MW 167.136
$C_9H_8O_3$
Isotopic Incorporation: >99% 13C Purity: >98%



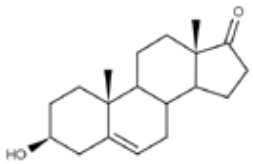
p-Coumaric acid-[13C3] [1261170-80-2; unlabeled:501-98-4] *H3af*	25172-1	1 mg
	25172-5	5 mg

MW 167.136
$C_9H_8O_3$
Isotopic Incorporation: >99% 13C Purity: >98%



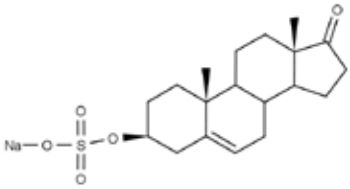
	Catalog #	Size
Dehydroepiandrosterone [53-43-0] *H3af*	25174-1	1 mg
	25174-5	5 mg
	25174-10	10 mg

MW 288.4244
$C_{19}H_{28}O_2$
Purity: ≥98%



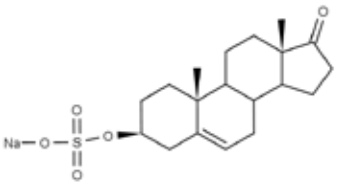
Dehydroepiandrosterone sulfate sodium salt [78590-17-7]	25178-1	1 mg
	25178-5	5 mg
	25178-10	10 mg

MW 390.4689
$C_{19}H_{27}NaO_5S$
Purity: ≥98%



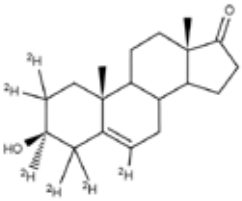
Dehydroepiandrosterone sulfate sodium salt; methanol solution (1mL) [78590-17-7] *CH6g*	25180-0.1	100 µg/ml
	25180-1	1 mg/ml

MW 390.46899
$C_{19}H_{27}NaO_5S$
Purity: ≥98%



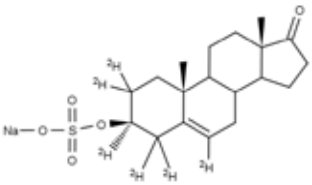
Dehydroepiandrosterone-[2H6] [1261254-39-0; unlabeled: 53-43-0] *H3af*	25173-5	5 mg
	25173-10	10 mg

MW 294.4613
$C_{19}H_{28}O_2$
Isotopic Incorporation: 97% 2H Purity: ≥98%



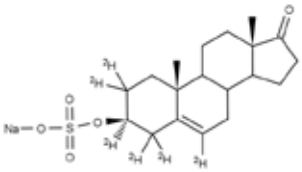
Dehydroepiandrosterone-[2H6] sulfate sodium salt [1261254-41-4] *A3af*	25177-1	1 mg
	25177-5	5 mg
	25177-10	10 mg

MW 396.506
$C_{19}H_{27}NaO_5S$
Isotopic Incorporation: 97% 2H Purity: ≥98%



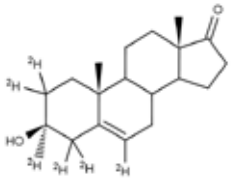
	Catalog #	Size
Dehydroepiandrosterone-[2H6] sulfate sodium salt; methanol solution (1mL) [1261254-41-4; unlabeled: 78590-17-7] *CH6g*	25179-0.1	100 µg/ml
	25179-1	1 mg/ml

MW 396.50601
$C_{19}H_{27}NaO_5S$
Isotopic Incorporation: 97% 2H Purity: ≥98%



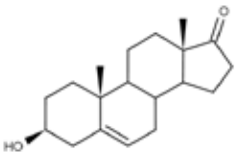
	Catalog #	Size
Dehydroepiandrosterone-[2H6]; methanol solution (1mL) [1261170-80-2; unlabeled: 53-43-0] *CH6af*	25175-0.1	100 µg/ml
	25175-1	1 mg/ml

MW 294.4614
$C_{19}H_{28}O_2$
Isotopic Incorporation: 97% 2H Purity: ≥98%



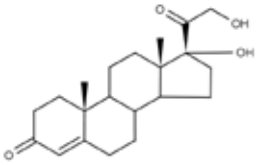
	Catalog #	Size
Dehydroepiandrosterone; methanol solution (1mL) [53-43-0] *CH6af*	25176-0.1	100 µg/ml
	25176-1	1 mg/ml

MW 288.42441
$C_{19}H_{28}O_2$
Purity: ≥98%



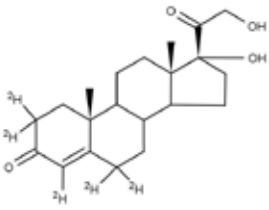
	Catalog #	Size
11-Deoxycortisol [152-58-9]	25182-1	1 mg
	25182-5	5 mg
	25182-10	10 mg

MW 346.4605
$C_{21}H_{30}O_4$
Purity: >98%



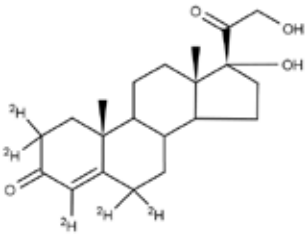
	Catalog #	Size
11-Deoxycortisol-[2H5] [1258063-56-7; unlabeled:152-58-9]	25181-1	1 mg
	25181-5	5 mg
	25181-10	10 mg

MW 351.4913
$C_{21}H_{30}O_4$
Isotopic Incorporation: 98% 2H Purity: >99%



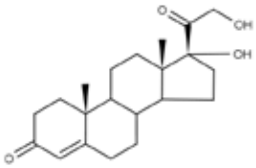
	Catalog #	Size
11-Deoxycortisol-[2H5]; methanol solution (1 mL) [1258063-56-7; unlabeled: 152-58-9] *CH6af*	25183-0.1	100 µg/ml
	25183-1	1 mg/ml

MW 351.4913
$C_{21}H_{30}O_4$
Isotopic Incorporation: 98% 2H Purity: >99%



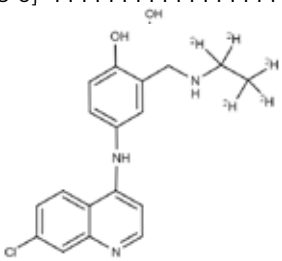
11-Deoxycortisol; methanol solution (1 mL) [152-58-9] *CH6af*	25184-0.1	100 µg/ml
	25184-1	1 mg/ml

MW 346.46051
$C_{21}H_{30}O_4$
Purity: >98%



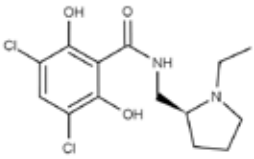
Desethylamodiaquine-[2H5] [11730223-19-2; unlabeled: 79352-78-6]	25185-2	2 mg
	25185-5	5 mg

MW 332.8389
$C_{18}H_{18}ClN_3O$
Isotopic Incorporation: 97% 2H; 4.89 D/molecule Purity: ≥98%



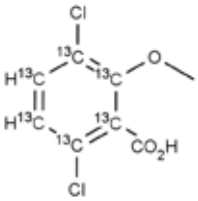
Desethylraclopride [119670-11-0]	25187-5	5 mg
	25187-25	25 mg

MW 333.20999
$C_{14}H_{18}Cl_2N_2O_3$
Purity: ≥98%



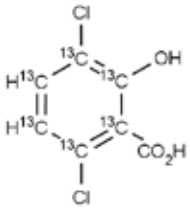
Dicamba-[13C6] [1173032-06-7; unlabeled: 1918-00-9]	25188-2	2 mg
	25188-5	5 mg
	25188-10	10 mg

MW 226.993
$C_8H_6Cl_2O_3$
Isotopic Incorporation: 99% 13C Purity: ≥98%

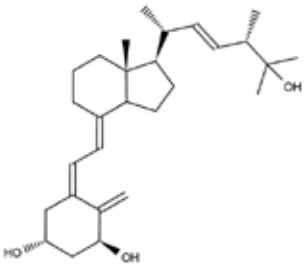


	Catalog #	Size
3,6-Dichloro-2-hydroxybenzoic-[13C6] Acid [1173019-34-5; unlabeled: 3401-80-7]	25190-2	2 mg
	25190-5	5 mg
	25190-10	10 mg
1,25-Dihydroxyvitamin-D2 [60133-18-8] *HSVW3af*	25197-0.1	0.1 mg
	25197-1	1 mg
1,25-Dihydroxyvitamin-D2-[2H3] [1261254-46-9; unlabeled: 60133-18-8] *HSVW3af*	25196-0.1	0.1 mg
1,25-Dihydroxyvitamin-D2-[2H3]; ethanol solution (1mL) [1261254-46-9; unlabeled: 60133-18-8] *CHSVW5af*	25198-.005	5 µg/ml
	25198-0.05	50 µg/ml
	25198-0.1	100 µg/ml

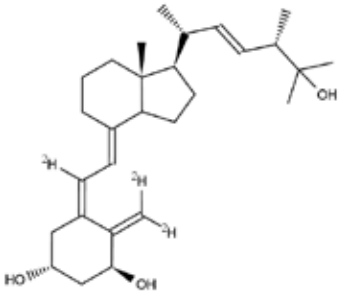
3,6-Dichloro-2-hydroxybenzoic-[13C6] Acid [1173019-34-5; unlabeled: 3401-80-7]
MW 212.967
$C_7H_4Cl_2O_3$
Isotopic Incorporation: 99% 13C Purity: >96%



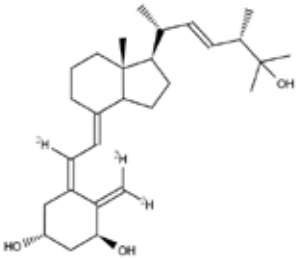
1,25-Dihydroxyvitamin-D2 [60133-18-8] *HSVW3af*
MW 428.64719
$C_{28}H_{44}O_3$
Purity: ≥97%



1,25-Dihydroxyvitamin-D2-[2H3] [1261254-46-9; unlabeled: 60133-18-8] *HSVW3af*
MW 431.66559
$C_{28}H_{44}O_3$
Isotopic Incorporation: 99% 2H Purity: ≥95%

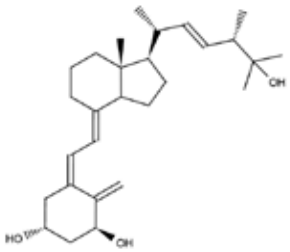


1,25-Dihydroxyvitamin-D2-[2H3]; ethanol solution (1mL)
[1261254-46-9; unlabeled: 60133-18-8] *CHSVW5af*
MW 431.66559
$C_{28}H_{44}O_3$
Isotopic Incorporation: 99% 2H Purity: ≥95%

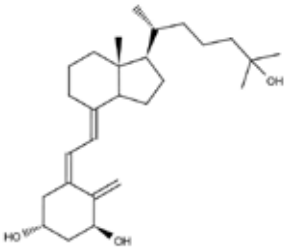


	Catalog #	Size
1,25-Dihydroxyvitamin-D2; ethanol solution (1mL) [60133-18-8] *CHSVW5af*	25199-.005	5 µg/ml
	25199-0.05	50 µg/ml
	25199-0.1	100 µg/ml
1,25-Dihydroxyvitamin-D3 [32222-06-3] *HPRS3abf*	25201-0.5	0.5 mg
	25201-1	1 mg
1,25-Dihydroxyvitamin-D3-[2H3] [128726-16-0; unlabeled: 32222-06-3] *HPRS3abf*	25200-1	1 mg
1,25-Dihydroxyvitamin-D3-[2H3]; ethanol solution (1mL) [128723-16-0; unlabeled: 32222-06-3] *CPRS5af*	25202-.005	5 µg/ml
	25202-0.05	50 µg/ml
	25202-0.1	100 µg/ml

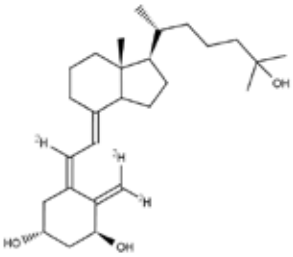
1,25-Dihydroxyvitamin-D2; ethanol solution (1mL) [60133-18-8] *CHSVW5af*
MW 428.64719
$C_{28}H_{44}O_3$
Purity: ≥97%



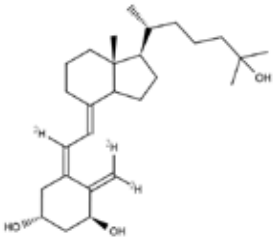
1,25-Dihydroxyvitamin-D3 [32222-06-3] *HPRS3abf*
MW 416.63651
$C_{27}H_{44}O_3$
Purity: ≥97%



1,25-Dihydroxyvitamin-D3-[2H3] [128726-16-0; unlabeled: 32222-06-3] *HPRS3abf*
MW 419.65491
$C_{27}H_{44}O_3$
Isotopic Incorporation: 97% 2H; >2.90D/molecule Purity: ≥96%

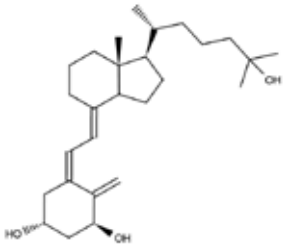


1,25-Dihydroxyvitamin-D3-[2H3]; ethanol solution (1mL) [128723-16-0; unlabeled: 32222-06-3] *CPRS5af*
MW 419.65491
$C_{27}H_{44}O_3$
Isotopic Incorporation: 97% 2H; >2.90D/molecule Purity: ≥96%

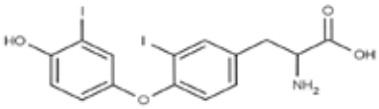


	Catalog #	Size
1,25-Dihydroxyvitamin-D3; ethanol solution (1mL) [32222-06-3] *CPRS5af*	25203-.005	5 µg/ml
	25203-0.05	50 µg/ml
	25203-0.1	100 µg/ml
L-3,3'-Diiodothyronine [70-40-6] *HV3af*	25205-1	1 mg
	25205-5	5 mg
	25205-10	10 mg
L-3,3'-Diiodothyronine -[13C6] [1217459-13-6; unlabeled: 70-40-6] *HV3af*	25204-1	1 mg
	25204-5	5 mg
	25204-10	10 mg
1,3-Dimethyluric Acid-[13C4,15N3] [1173019-16-3; unlabeled: 944-73-0] *A3af*	25206-1	1 mg
	25206-2	2 mg
	25206-5	5 mg
1,7-Dimethyluric Acid-[13C4,15N3] [117773023-17-0; unlabeled: 33868-03-0] *A3af*	25207-1	1 mg
	25207-2	2 mg
	25207-5	5 mg

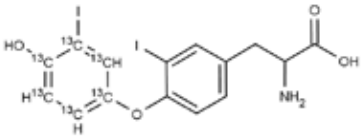
1,25-Dihydroxyvitamin-D3; ethanol solution (1mL) [32222-06-3] *CPRS5af*
MW 416.63651
$C_{27}H_{44}O_3$
Purity: ≥97%



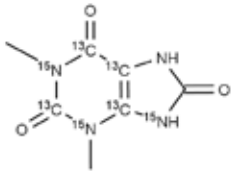
L-3,3'-Diiodothyronine [70-40-6] *HV3af*
MW 525.07703
$C_{15}H_{13}I_2NO_4$
Purity: ≥98%



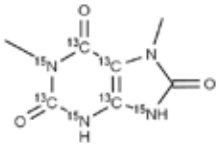
L-3,3'-Diiodothyronine -[13C6] [1217459-13-6; unlabeled: 70-40-6] *HV3af*
MW 531.0329
$C_{15}H_{13}I_2NO_4$
Isotopic Incorporation: 99.4% 13C Purity: ≥97%



1,3-Dimethyluric Acid-[13C4,15N3] [1173019-16-3; unlabeled: 944-73-0] *A3af*
MW 203.1143
$C_7H_8N_4O_3$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%

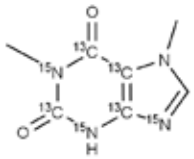


1,7-Dimethyluric Acid-[13C4,15N3] [117773023-17-0; unlabeled: 33868-03-0] *A3af*
MW 203.1143
$C_7H_8N_4O_3$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%



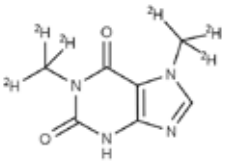
	Catalog #	Size
1,7 Dimethylxanthine-[13C4,15N3] [1173018-79-5; unlabeled: 611-59-6] *H3af*	25208-2	2 mg
	25208-5	5 mg

MW 187.1149
$C_7H_8N_4O_2$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%



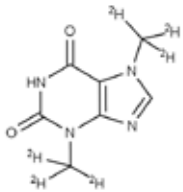
1,7 Dimethylxanthine-[2H6] [117490-41-2; unlabeled: 611-59-6] *H3af*	25209-2	2 mg
	25209-5	5 mg

MW 186.201
$C_7H_8N_4O_2$
Isotopic Incorporation: 98% 2H Purity: ≥98%



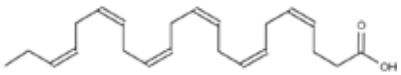
3,7 Dimethylxanthine-[2H6] [117490-40-1] *H3af*	25210-2	2 mg
	25210-5	5 mg

MW 186.201
$C_7H_8N_4O_2$
Isotopic Incorporation: 98% 2H Purity: ≥98%



cis-4,7,10,13,16,19-Docosahexaenoic acid [6217-54-5] *EK3acf*	25213-1	1 mg
	25213-5	5 mg

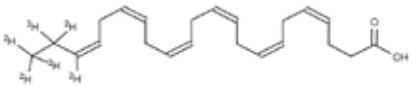
MW 328.48831
$C_{22}H_{32}O_2$
Purity: ≥98%



cis-4,7,10,13,16,19-Docosahexaenoic acid-[21,21,22,22,22-2H5]

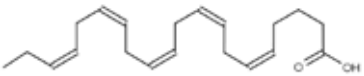
[1197205-71-2; unlabeled: 6217-54-5] *EK3acf*	25212-1	1 mg
	25212-5	5 mg

MW 334.5253
$C_{22}H_{32}O_2$
Isotopic Incorporation: >98% 2H Purity: ≥98%



cis-5,8,11,14,17-Eicosapentaienoic acid [10417-94-4] *BK3acf*	25215-1	1 mg
	25215-5	5 mg

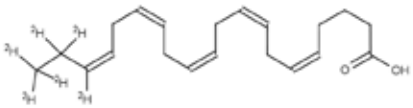
MW 302.45099
$C_{20}H_{30}O_2$
Purity: ≥98%



cis-5,8,11,14,17-Eicosapentaienoic acid-[19,19,19,20,20,20-2H5]

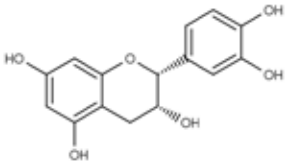
[1197205-73-4; unlabeled: 10417-94-4] *BK3acf*	25214-1	1 mg
	25214-5	5 mg

MW 308.48801
$C_{20}H_{30}O_2$
Isotopic Incorporation: >98% 2H Purity: ≥98%



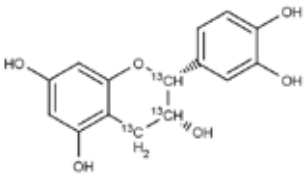
	Catalog #	Size
(+/-)-Epicatechin [490-46-0] *H3af*	25219-1	1 mg
	25219-5	5 mg

MW 290.2681
$C_{15}H_{14}O_6$
Purity: ≥97%



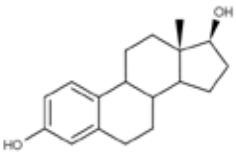
(+/-)-Epicatechin-[13C3] [1217780-28-3; unlabeled: 490-46-0] *H3af*	25218-1	1 mg
	25218-5	5 mg

MW 293.246
$C_{15}H_{14}O_6$
Isotopic Incorporation: >99% 13C Purity: ≥97%



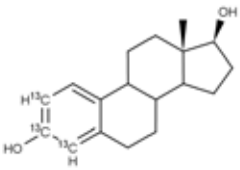
17β-Estradiol [50-28-2] *HM3af*	25221-1	1 mg
	25221-5	5 mg
	25221-10	10 mg

MW 272.38199
$C_{18}H_{24}O_2$
Purity: ≥98%



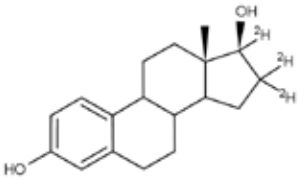
17β-Estradiol-[2,3,4-13C3] [1261254-48-1; unlabeled: 50-28-2] *HM3af*	25220-1	1 mg
	25220-5	5 mg
	25220-10	10 mg

MW 275.35989
$C_{18}H_{24}O_2$
Isotopic Incorporation: >99% 13C Purity: ≥98%



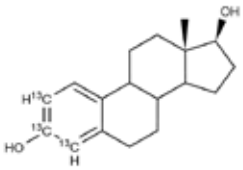
Estradiol-[16,16,17-2H3] [79037-37-9; unlabeled: 50-28-2] *HM3af*	25224-25	25 mg
	25224-50	50 mg

MW 275.40039
$C_{18}H_{24}O_2$
Isotopic Incorporation: 98% 2H Purity: ≥98%

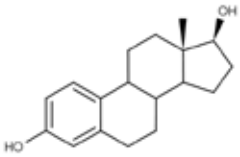


	Catalog #	Size
17β-Estradiol-[2,3,4-13C3]; acetonitrile solution (1 mL) [1261254-48-1; unlabeled: 50-2802] *CHM7acf*	25222-0.05	50 µg/ml
	25222-0.1	100 µg/ml
17β-Estradiol; acetonitrile solution (1 mL) [50-28-2] *CHM7acf*	25223-0.05	50 µg/ml
	25223-0.1	100 µg/ml
Estrone [53-16-7] *HM3af*	25225-1	1 mg
	25225-5	5 mg
	25225-10	10 mg
Estrone, 3-methyl ether [1624-62-0] *HM3af*	25229-1	1 mg
	25229-5	5 mg
	25229-10	10 mg
Estrone, 3-methyl-[13C,2H3] ether [1261254-60-7; unlabeled: 1624-62-0] *HM3af*	25228-5	5 mg
	25228-10	10 mg
Estrone-[2,3,4-13C3] [1241684-29-6; unlabeled: 53-16-7] *HM3ag*	25128-1	1 mg
	25128-5	5 mg

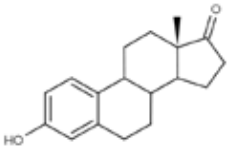
17β-Estradiol-[2,3,4-13C3]; acetonitrile solution (1 mL)
MW 275.35989
$C_{18}H_{24}O_2$
Isotopic Incorporation: >99% 13C Purity: ≥98%



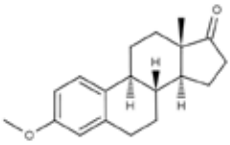
17β-Estradiol; acetonitrile solution (1 mL) [50-28-2] *CHM7acf*
MW 272.38199
$C_{18}H_{24}O_2$
Purity: ≥98%



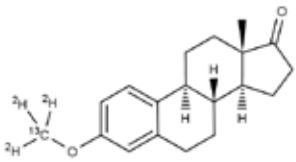
Estrone [53-16-7] *HM3af*
MW 270.366
$C_{18}H_{22}O_2$
Purity: ≥98%



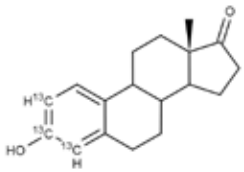
Estrone, 3-methyl ether [1624-62-0] *HM3af*
MW 284.3927
$C_{19}H_{24}O_2$
Purity: ≥98%



Estrone, 3-methyl-[13C,2H3] ether [1261254-60-7; unlabeled: 1624-62-0] *HM3af*
MW 288.403
$C_{19}H_{24}O_2$
Isotopic Incorporation: 99% 13C; 98% 2H
Purity: ≥98%

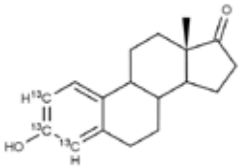


Estrone-[2,3,4-13C3] [1241684-29-6; unlabeled: 53-16-7] *HM3ag*
MW 273.343
$C_{18}H_{22}O_2$
Isotopic Incorporation: ≥99% 13C Purity: ≥98%

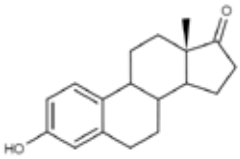


	Catalog #	Size
Estrone-[2,3,4-13C3]; methanol solution (1 mL) [1241684-29-6; unlabeled: 53-16-7] *CHM6af*	25226-0.05	50 µg/ml
	25226-0.1	100 µg/ml
Estrone; methanol solution (1 mL) [53-16-7] *CHM6af*	25227-0.05	50 µg/ml
	25227-0.1	100 µg/ml
Fallypride Tosylate [166173-74-6] *H3af*	25230-2	2 mg
	25230-10	5x2 mg
	25230-20	10x2 mg
Ferulic acid-[13C3] [1217676-14-6; unlabeled: 537-98-4]	25231-1	1 mg
	25231-5	5 mg
FP-TZTP Flouro Standard [424829-90-3]	25235-10	10 mg
	25235-25	25 mg
FP-TZTP Precursor [606114-32-3]	25234-25	25 mg
	25234-50	50 mg
	25234-100	100 mg

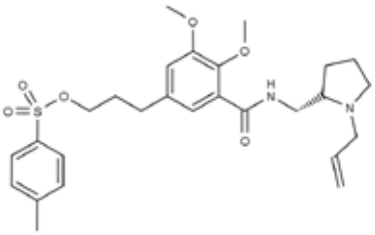
Estrone-[2,3,4-13C3]; methanol solution (1 mL) [1241684-29-6; unlabeled: 53-16-7] *CHM6af*
MW 273.34399
$C_{18}H_{22}O_2$
Isotopic Incorporation: >99% 13C Purity: >98%



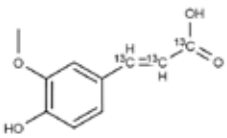
Estrone; methanol solution (1 mL) [53-16-7] *CHM6af*
MW 270.36609
$C_{18}H_{22}O_2$
Purity: ≥98%



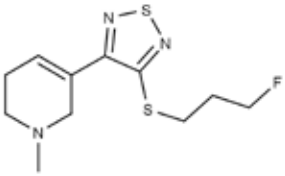
Fallypride Tosylate [166173-74-6] *H3af*
MW 516.65002
$C_{27}H_{36}N_2O_6S$
Purity: 99%



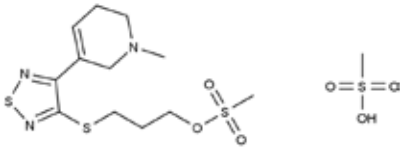
Ferulic acid-[13C3] [1217676-14-6; unlabeled: 537-98-4]
MW 197.162
$C_{10}H_{10}O_4$
Isotopic Incorporation: 99.2% 13C Purity: >98%

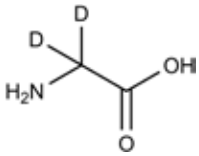
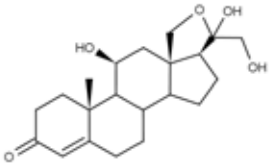
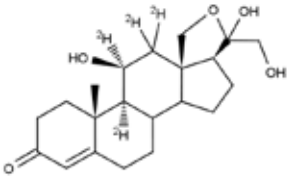
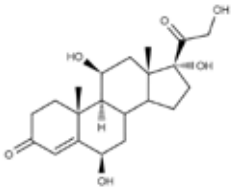
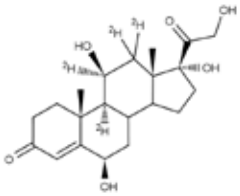
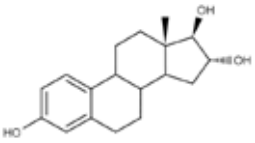


FP-TZTP Flouro Standard [424829-90-3]
MW 273.39301
$C_{11}H_{16}FN_3S_2$
Purity: ≥98%

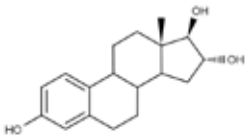


FP-TZTP Precursor [606114-32-3]
MW 445.59799
$C_{13}H_{23}N_3O_6S_4$
Purity: ≥98%

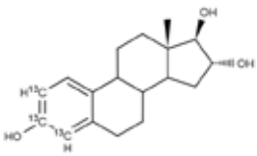


	Catalog #	Size
Glycine-2,2-d2 [4896-75-7] MW 77.08 mp 240 °C Appearance: Solid $C_2H_3D_2NO_2$ 	25385-100 25385-500	100 mg 500 mg
18-Hydroxycorticosterone [561-65-9] MW 362.4599 $C_{21}H_{30}O_5$ Purity: ≥98% 	25237-1	1 mg
18-Hydroxycorticosterone-[2H4] [1257742-38-3; unlabeled: 561-65-9] MW 366.4845 $C_{21}H_{30}O_5$ Isotopic Incorporation: 98% 2H Purity: ≥98% 	25236-1	1 mg
6β-Hydroxycortisol [3078-34-0] MW 378.45929 $C_{21}H_{30}O_6$ Purity: ≥97% 	25239-0.1 25239-1	100 mg 1 mg
6β-Hydroxycortisol-[2H4] [1261254-51-6; unlabeled: 3078-34-0] MW 382.48389 $C_{21}H_{30}O_6$ Isotopic Incorporation: 3.77 2H/molecule Purity: ≥97% 	25238-1	1 mg
16-α-Hydroxyestradiol (Estriol) [50-27-1] MW 288.38141 $C_{18}H_{24}O_3$ Purity: ≥97% 	25241-1 25241-5 25241-10	1 mg 5 mg 10 mg

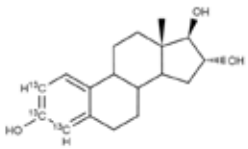
	Catalog #	Size
16-α-Hydroxyestradiol (Estriol); methanol solution (1 mL) [50-27-1] *CHM6af*	25243-.005	5 µg/ml
MW 288.38141	25243-0.05	50 µg/ml
$C_{18}H_{24}O_3$	25243-0.1	100 µg/ml
Purity: ≥97%		



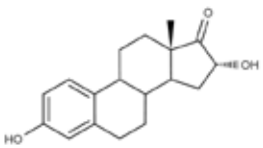
16-α-Hydroxyestradiol-[2,3,4-13C3] (Estriol-13C3) [1255639-56-5; unlabeled: 50-27-1]	25240-0.1	100 µg
MW 291.35931	25240-0.25	250 µg
$C_{18}H_{24}O_3$	25240-0.5	500 µg
Isotopic Incorporation: >99% 13C Purity: ≥98%	25240-1	1 mg



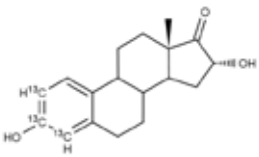
16-α-Hydroxyestradiol-[2,3,4-13C3] (Estriol-13C3); methanol solution (1 mL) [1255639-56-5; unlabeled: 50-27-1] *CHM6af*	25242-.005	5 µg/ml
MW 291.35931	25242-0.05	50 µg/ml
$C_{18}H_{24}O_3$	25242-0.1	100 µg/ml
Isotopic Incorporation: >99% 13C Purity: ≥98%		



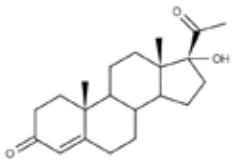
16-α-Hydroxyestrone [566-76-7]	25245-1	1 mg
MW 286.36551	25245-5	5 mg
$C_{18}H_{22}O_3$	25245-10	10 mg
Purity: ≥98%		



16-α-Hydroxyestrone-[2,3,4-13C3] [1241684-28-5; unlabeled: 566-76-7]	25244-0.1	100 µg
MW 289.34	25244-0.25	250 µg
$C_{18}H_{22}O_3$	25244-0.5	500 µg
Isotopic Incorporation: ≥99% 13C Purity: ≥98%	25244-1	1 mg

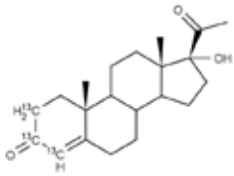


17α-Hydroxyprogesterone [68-96-2]	25247-1	1 mg
MW 330.46109	25247-5	5 mg
$C_{21}H_{30}O_3$	25247-10	10 mg
Purity: ≥98%		



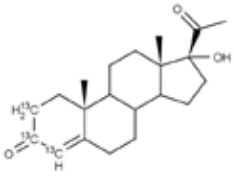
	Catalog #	Size
17α-Hydroxyprogesterone-[2,3,4-13C3] [unlabeled: 68-96-2]	25246-1	1 mg
	25246-5	5 mg

MW 333.43909
$C_{21}H_{30}O_3$
Isotopic Incorporation: >98% 13C Purity: ≥98%



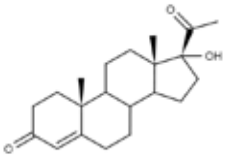
17α-Hydroxyprogesterone-[2,3,4-13C3]; methanol solution (1 mL) [unlabeled: 68-96-2] *CHV7af*	25248-0.1	100 µg/ml
	25248-1	1 mg/ml

MW 333.43909
$C_{21}H_{30}O_3$
Isotopic Incorporation: >98% 13C Purity: ≥98%



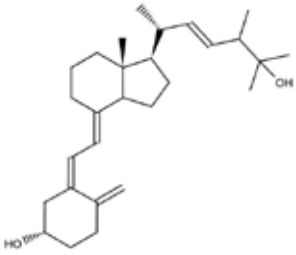
17α-Hydroxyprogesterone; methanol solution (1 mL) [25249-16-5] *CHV7af*	25249-0.1	100 µg/ml
	25249-1	1 mg/ml

MW 330.46109
$C_{21}H_{30}O_3$
Purity: ≥95%



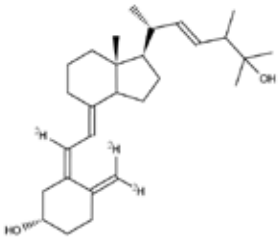
25-Hydroxyvitamin-D2 [21343-40-8]	25251-1	1 mg

MW 412.6478
$C_{28}H_{44}O_2$
Purity: ≥98%

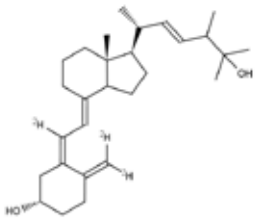


25-Hydroxyvitamin-D2-[2H3] [1217467-39-4; unlabeled: 21343-40-8]	25250-1	1 mg

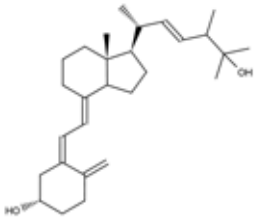
MW 415.6662
$C_{28}H_{44}O_2$
Isotopic Incorporation: 97% 2H; >2.90/molecule Purity: ≥98%



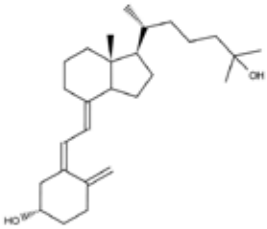
	Catalog #	Size
25-Hydroxyvitamin-D2-[2H3]; ethanol solution (1 mL) [1217467-39-4; unlabeled: 67-97-0] *CHV5af* . .	25252-.005	5 µg/ml
MW 415.6662	25252-0.05	50 µg/ml
$C_{28}H_{44}O_2$	25252-0.1	100 µg/ml
Isotopic Incorporation: 97% 2H; >2.90D/molecule Purity: ≥98%		



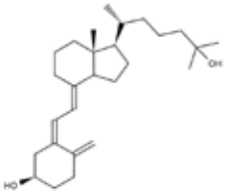
25-Hydroxyvitamin-D2; ethanol solution (1 mL) [21343-40-8] *CHV5af*	25253-.005	5 µg/ml
MW 412.6478	25253-0.05	50 µg/ml
$C_{28}H_{44}O_2$	25253-0.1	100 µg/ml
Purity: ≥98%		



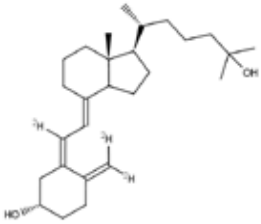
25-Hydroxyvitamin-D3 [19356-17-3]	25255-5	5 mg
MW 400.63708		
$C_{27}H_{44}O_2$		
Purity: ≥98%		



3-Epi-25-Hydroxyvitamin-D3 [73809-05-9] *HP3af*	25216-1	1 mg
MW 400.63708		
$C_{27}H_{44}O_2$		
Purity: ≥98%		

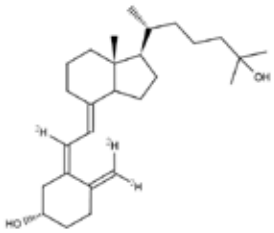


25-Hydroxyvitamin-D3-[2H3] [140710-94-7; unlabeled: 19356-17-3]	25254-1	1 mg
MW 403.65549	25254-5	5 mg
$C_{27}H_{44}O_2$		
Isotopic Incorporation: 97% 2H; ≥2.90D/molecule Purity: ≥98%		

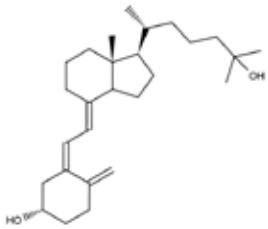


	Catalog #	Size
25-Hydroxyvitamin-D3-[2H3]; ethanol solution (1 mL) [140710-94-7; unlabeled: 19356-17-3] *CHVWX7af*	25256-.005	5 µg/ml
	25256-0.05	50 µg/ml
	25256-0.1	100 µg/ml
25-Hydroxyvitamin-D3; ethanol solution (1 mL) [19356-17-3] *CHVWX7af*	25257-.005	5 µg/ml
	25257-0.05	50 µg/ml
	25257-0.1	100 µg/ml
3-Epi-25-Hydroxyvitamin-D3; ethanol solution (1 mL) [73809-05-9] *CHP5af*	25217-0.05	50 µg/ml
	25217-0.1	100 µg/ml
3-Iodothyronamine-[ethylamino-1,1,2,2-2H4] hydrochloride [712349-95-6]	25260-1	1 mg
Isophorone-[2,4,4,6,6-2H5] [1262769-87-8; unlabeled: 78-59-1]	25261-10	10 mg
	25261-25	25 mg
	25261-50	50 mg
	25261-100	100 mg

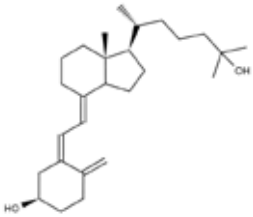
25-Hydroxyvitamin-D3-[2H3]; ethanol solution (1 mL)
MW 403.65549
$C_{27}H_{44}O_2$
Isotopic Incorporation: 97% 2H; ≥2.90D/molecule Purity: ≥98%



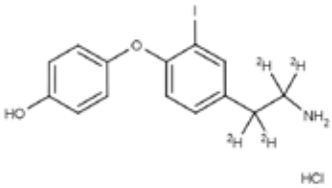
25-Hydroxyvitamin-D3; ethanol solution (1 mL) [19356-17-3] *CHVWX7af*
MW 400.63708
$C_{27}H_{44}O_2$
Purity: ≥98%



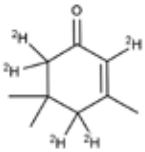
3-Epi-25-Hydroxyvitamin-D3; ethanol solution (1 mL) [73809-05-9] *CHP5af*
MW 400.63708
$C_{27}H_{44}O_2$
Purity: ≥98%



3-Iodothyronamine-[ethylamino-1,1,2,2-2H4] hydrochloride [712349-95-6]
MW 395.65701
$C_{14}H_{15}ClINO_2$
Isotopic Incorporation: >98% 2H Purity: ≥98%

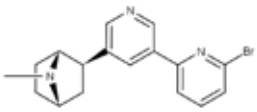


Isophorone-[2,4,4,6,6-2H5] [1262769-87-8; unlabeled: 78-59-1]
MW 143.2377
$C_9H_{14}O$
Isotopic Incorporation: 97% D Purity: ≥95%



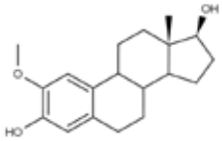
	Catalog #	Size
JHU87571 [1044503-80-1] *HU4af*	25262-1	1 mg
	25262-5	5 mg

MW 344.24899
$C_{17}H_{18}BrN_3$
Purity: ≥98%



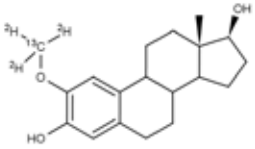
2-Methoxy estradiol [362-07-2] *HM3af*	25264-1	1 mg
	25264-5	5 mg
	25264-10	10 mg

MW 302.4079
$C_{19}H_{26}O_3$
Purity: ≥98%



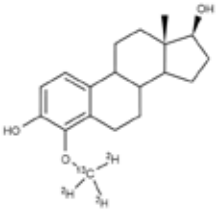
2-Methoxy-[13C,2H3]-estradiol [1217470-09-1; unlabeled: 362-07-2] *HM3af*	25263-1	1 mg

MW 306.4191
$C_{19}H_{26}O_3$
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%



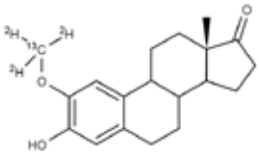
4-Methoxy-[13C,2H3]-estradiol [1217442-62-0; unlabeled: 26788-23-8] *HM3af*	25267-1	1 mg

MW 300.4191
$C_{19}H_{26}O_3$
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%



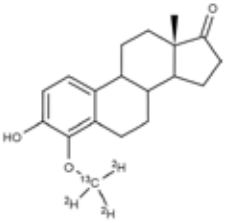
2-Methoxy-[13C,2H3]-estrone [1217460-84-8; unlabeled: 362-08-3] *HM4af*	25265-1	1 mg

MW 304.4032
$C_{19}H_{24}O_3$
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%



4-Methoxy-[13C,2H3]-estrone [1217437-34-7; unlabeled: 58562-33-7] *HM4af*	25269-1	1 mg

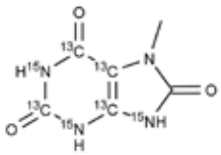
MW 304.4032
$C_{19}H_{24}O_3$
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥98%



	Catalog #	Size
4-Methoxyestradiol [26788-23-8] *HM3af* MW 302.4079 $C_{19}H_{26}O_3$ Purity: ≥98%	25268-1 25268-5 25268-10	1 mg 5 mg 10 mg
2-Methoxyestrone [362-08-3] *HM4af* MW 300.39209 $C_{19}H_{24}O_3$ Purity: ≥98%	25266-1 25266-5	1 mg 5 mg
4-Methoxyestrone [58562-33-7] *HM4af* MW 300.39209 $C_{19}H_{24}O_3$ Purity: ≥97%	25270-1 25270-5 25270-10	1 mg 5 mg 10 mg
α-Methyltryptophan Precursor [136057-11-9] MW 416.447 $C_{20}H_{20}N_2O_6S$ Purity: ≥99%	25271-50 25271-100	5x10 mg 10x10 mg
1-Methyluric Acid-[13C4,15N3] [1173022-91-7; unlabeled: 708-79-2] *H4af* MW 189.448 $C_6H_6N_4O_3$ Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%	25272-2 25272-5	2 mg 5 mg
3-Methyluric Acid-[13C4,15N3] [1173-19-10-7; unlabeled: 605-99-2] *H4af* MW 189.08771 $C_6H_6N_4O_3$ Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%	25273-2 25273-5	2 mg 5 mg

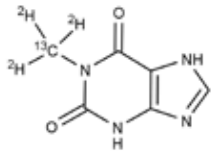
	Catalog #	Size
7-Methyluric Acid-[13C4,15N3] *H4af*	25274-2	2 mg
	25274-5	5 mg

MW 189.08771
$C_6H_6N_4O_3$
Isotopic Incorporation: 99% 13C; 98%15N Purity: ≥98%



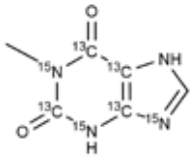
1-Methylxanthine-[13C,2N3] [1202865-49-3; unlabeled: 6136-37-4]	25276-1	1 mg
	25276-5	5 mg

MW 170.14861
$C_6H_6N_4O_2$
Isotopic Incorporation: 99% 13C; 98% 2H Purity: ≥97%



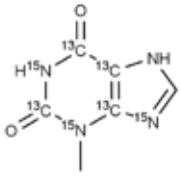
1-Methylxanthine-[13C4,15N3] [1173018-69-3; unlabeled: 6163-37-4]	25275-2	2 mg
	25275-5	5 mg

MW 173.0883
$C_6H_6N_4O_2$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%



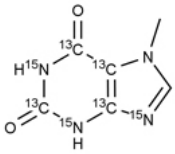
3-Methylxanthine-[13C4,15N3] [1173018-93-3; unlabeled: 1-76-22-8]	25277-2	2 mg
	25277-5	5 mg

MW 173.0883
$C_6H_6N_4O_2$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%



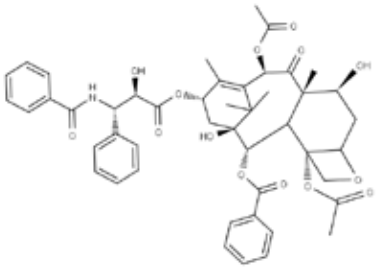
7-Methylxanthine-[13C4,15N3] [11730118-93-3; unlabeled: 552-62-5]	25278-2	2 mg
	25278-5	5 mg

MW 173.0883
$C_6H_6N_4O_2$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%



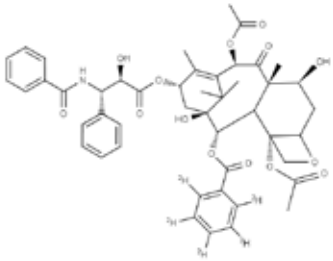
Paclitaxel [33069-62-4]	25281-1	1 mg
	25281-5	5 mg
	25281-10	10 mg

MW 853.90613
$C_{47}H_{51}NO_{14}$
Purity: ≥95%



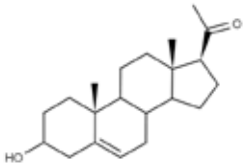
	Catalog #	Size
Paclitaxel-[2H5] [1261254-56-1; unlabeled: 33069-62-4]	25280-1	1 mg
	25280-5	5 mg

MW 858.93689
$C_{47}H_{51}NO_{14}$
Isotopic Incorporation: >98% 2H Purity: >97%



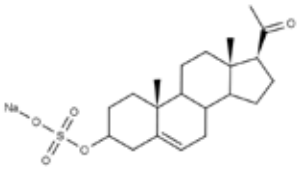
Pregnenolone [145-13-1]	25289-1	1 mg
	25289-5	5 mg
	25289-10	10 mg

$C_{21}H_{32}O_2$
Purity: ≥98%



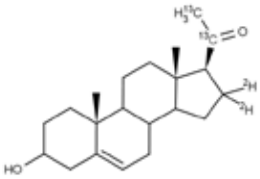
Pregnenolone sulfate sodium salt [1852-38-6]	25291-1	1 mg
	25291-5	5 mg
	25291-10	10 mg

MW 418.52301
$C_{21}H_{31}NaO_5S$
Purity: ≥98%



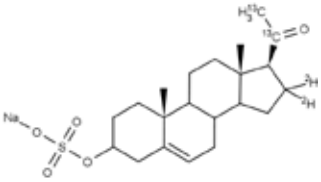
Pregnenolone-[20,21-13C2, 16,16-2H2] [unlabeled: 145-13-1]	25288-1	1 mg

MW 320.47519
$C_{21}H_{32}O_2$
Isotopic Incorporation: >99% 13C; >98% 2H. Purity: ≥98%



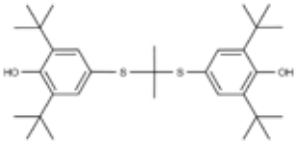
Pregnenolone-[20,21-13C2, 16,16-2H2] sulfate sodium salt [unlabeled: 1852-38-6]	25290-1	1 mg
	25290-5	5 mg

MW 422.51999
$C_{21}H_{31}NaO_5S$
Isotopic Incorporation: >99% 13C; >98% 2H Purity: ≥98%



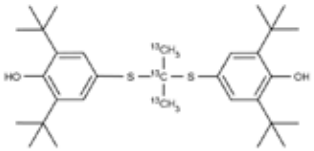
Probucol [23288-49-5]	25283-1	1 mg
	25283-5	5 mg
	25283-10	10 mg

MW 516.84198
$C_{31}H_{48}O_2S_2$
Purity: 96%



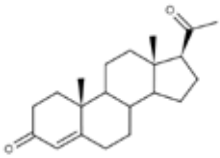
	Catalog #	Size
Probucol-[13C3] [1173019-29-8; unlabeled: 23288-49-5]	25282-10	10 mg
	25282-50	50 mg

MW 519.82001
$C_{31}H_{48}O_2S_2$
Isotopic Incorporation: 99% 13C Purity: >96%



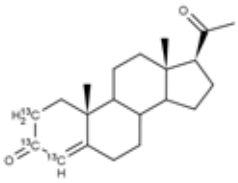
Progesterone [57-83-0]	25285-1	1 mg
	25285-5	5 mg
	25285-10	10 mg

MW 314.4617
$C_{21}H_{30}O_2$
Purity: ≥98%



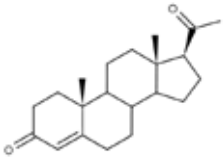
Progesterone-[2,3,4-13C3] [327048-87-3; unlabeled: 57-83-0]	25284-1	1 mg
	25284-5	5 mg

MW 317.4397
$C_{21}H_{30}O_2$
Isotopic Incorporation: 99% 13C Purity: ≥98%



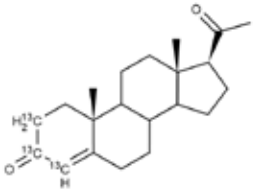
Progesterone; acetonitrile solution (1 mL) [57-83-0] *CHM7acf*	25287-0.05	50 µg/ml
	25287-0.1	100 µg/ml

MW 314.4617
$C_{21}H_{30}O_2$
Purity: ≥98%



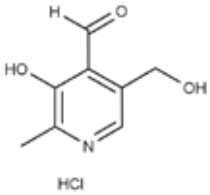
Progesterone-[2,3,4-13C3]; acetonitrile solution (1 mL) [327048-87-3; unlabeled: 57-83-0] *CHM7acf*	25286-0.05	50 µg/ml
	25286-0.1	100 µg/ml

MW 317.4397
$C_{21}H_{30}O_2$
Isotopic Incorporation: 99% 13C Purity: ≥98%

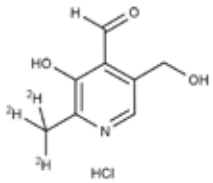


Pyridoxal hydrochloride [65-22-5]	25293-1	1 mg
	25293-5	5 mg
	25293-10	10 mg

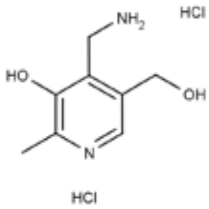
MW 203.623
$C_8H_{10}ClNO_3$
Purity: ≥98%



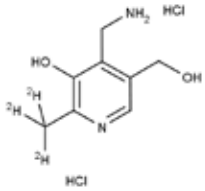
	Catalog #	Size
Pyridoxal-[2H3] hydrochloride [1173023-49-8; unlabeled: 65-22-5]	25292-1	1 mg
MW 206.64101	25292-5	5 mg
$C_8H_{10}ClNO_3$	25292-10	10 mg
Isotopic Incorporation: 98% 2H; (M+2.99) Purity: ≥98%		



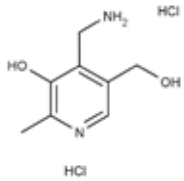
Pyridoxamine dihydrochloride [524-36-7]	25295-1	1 mg
MW 241.11501		
$C_8H_{14}Cl_2N_2O_2$		
Purity: >98%		



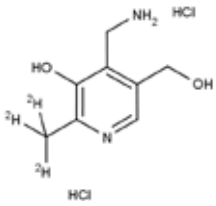
Pyridoxamine dihydrochloride [1173023-45-4; unlabeled: 524-36-7]	25295-5	5 mg
MW 244.133		
$C_8H_{14}Cl_2N_2O_2$		
Isotopic Incorporation: 98% 2H; (M+2.99) Purity: ≥98%		



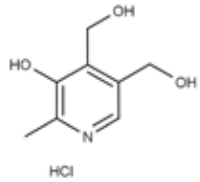
Pyridoxamine dihydrochloride [524-36-7]	25295-10	10 mg
MW 241.11501		
$C_8H_{14}Cl_2N_2O_2$		
Purity: >98%		



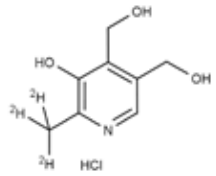
Pyridoxamine-[2H3] dihydrochloride [1173023-45-4; unlabeled: 524-36-7]	25294-1	1 mg
MW 244.133	25294-5	5 mg
$C_8H_{14}Cl_2N_2O_2$		
Isotopic Incorporation: 98% 2H; (M+2.99) Purity: ≥98%		



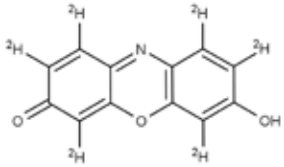
Pyridoxine hydrochloride [58-56-0]	25297-1	1 mg
MW 205.63901	25297-5	5 mg
$C_8H_{12}ClNO_3$	25297-10	10 mg
Purity: ≥96%		



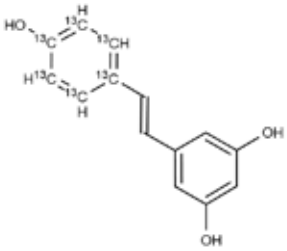
	Catalog #	Size
Pyridoxine-[2H3] hydrochloride [1189921-12-7; unlabeled: 58-56-0]	25296-1	1 mg
MW 208.657	25296-5	5 mg
$C_8H_{12}ClNO_3$	25296-10	10 mg
Isotopic Incorporation: 98% 2H Purity: ≥96%		



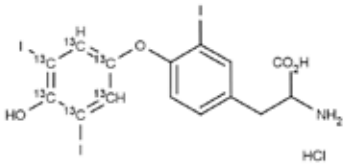
Resorufin-[2H6] [1196157-65-9; unlabeled: 635-78-9]	25298-10	10 mg
MW 219.22591	25298-50	50 mg
$C_{12}H_7NO_3$		
Isotopic Incorporation: >98% 2H Purity: ≥98%		



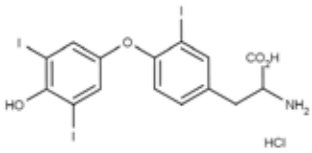
Resveratrol-[13C6] [1185247-70-4; unlabeled: 501-36-0]	25299-1	1 mg
MW 234.1992	25299-5	5 mg
$C_{14}H_{12}O_3$	25299-10	10 mg
Isotopic Incorporation: >99% 13C Purity: ≥97.8%		



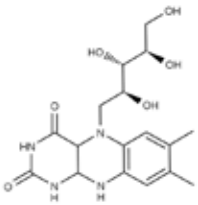
Reverse Triiodothyro-nine-[diiodophenyl-ring-13C6] hydrochloride [1217676-14-6; unlabeled: 2614-70-2]	25300-1	1 mg
MW 693.39001	25300-5	5 mg
$C_{15}H_{13}ClI_3NO_4$	25300-10	10 mg
Isotopic Incorporation: >99% 13C Purity: ≥95%		



Reverse Triiodothyronine hydrochloride [2614-70-2]	25301-1	1 mg
MW 687.43402		
$C_{15}H_{13}ClI_3NO_4$		
Purity: ≥95%		

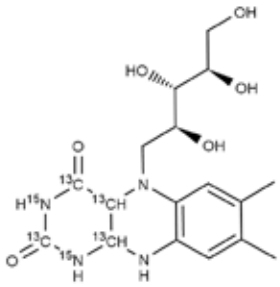


Riboflavin (Vitamin B2) [83-88-5]	25303-1	1 mg
MW 380.39569	25303-5	5 mg
$C_{17}H_{24}N_4O_6$	25303-10	10 mg
Purity: ≥97%		



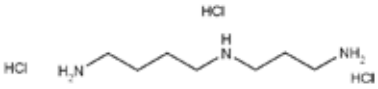
	Catalog #	Size
Riboflavin-[13c4,15n2] (Vitamin B2)	25302-1	1 mg
	25302-5	5 mg
	25302-10	10 mg

MW 386.35309
$C_{17}H_{24}N_4O_6$
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥97%



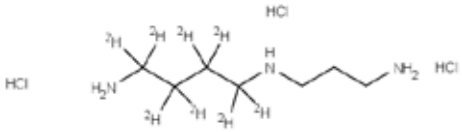
Spermidine 3HCl [334-50-9] *H4af*	25305-1	1 mg
	25305-5	5 mg
	25305-10	10 mg

MW 254.6289
$C_7H_{19}N_3$
Purity: >95%



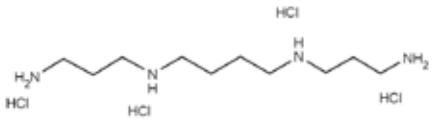
Spermidine-[2H6]•3HCl [1173019-26-5; unlabeled: 334-50-9] *H4af*	25304-5	5 mg
	25304-10	10 mg
	25304-50	50 mg
	25304-100	100 mg

MW 262.67801
$C_7H_{22}Cl_3N_3$
Isotopic Incorporation: 98.3%2H Purity: ≥95%



Spermine 4HCl [306-67-2] *H4af*	25307-1	1 mg
	25307-5	5 mg
	25307-10	10 mg

MW 348.1839
$C_{10}H_{30}C_{l4}N_4$
Purity: >95%

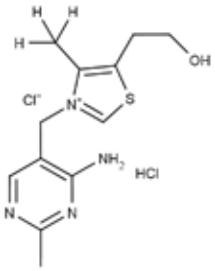


Spermine-[2H8] 4HCl [1173022-85-9; unlabeled: 306-67-2] *H4af*	25306-5	5 mg
	25306-10	10 mg

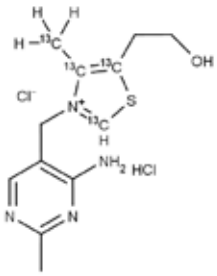
Isotopic Incorporation: 97% 2H Purity: >95%

Thiamine•HCl [67-03-8] *H4af*	25314-1	1 mg
	25314-5	5 mg
	25314-10	10 mg

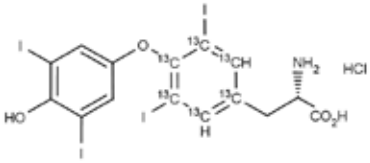
MW 337.269
$C_{12}H_{18}C_{l2}N_4OS$
Purity: ≥98%



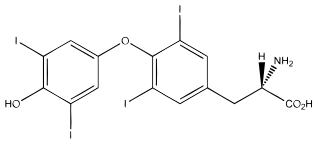
	Catalog #	Size
Thiamine-[13C4] HCl [1257525-77-1; unlabeled:67-03-8] *H4af*	25313-2	2 mg
MW 341.239	25313-5	5 mg
$C_{12}H_{18}C_{l2}N_4OS$	25313-10	10 mg
Isotopic Incorporation: >99% isotopic Purity: ≥98%		



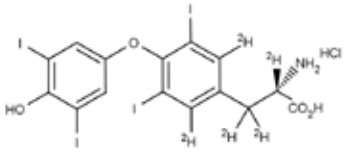
L-Thyroxine-[L-Tyr-ring-13C6] hydrochloride [720710-30-5; unlabeled:51-48-9]	25315-1	1 mg
MW 819.2869	25315-5	5 mg
Isotopic Incorporation: 99% 13C Purity: >98%	25315-10	10 mg



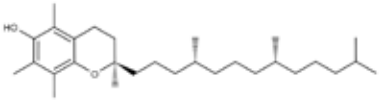
L-Thyroxine HCl [51-48-9] *H3af*	25317-1	1 mg
MW 813.3309	25317-5	5 mg
$C_{15}H_{11}I_4NO_4$	25317-10	10 mg
Purity: ≥98%		



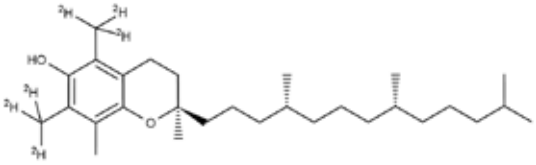
L-Thyroxine-[L-Tyr-2H5] hydrochloride [1261254-57-3; unlabeled: 51-48-9] *H3af*	25316-1	1 mg
MW 818.3619	25316-5	5 mg
$C_{15}H_{12}C_{l}I_4NO_4$	25316-10	10 mg
Isotopic Incorporation: 98% 2H; ≥4.90 D/molecule Purity: ≥98%		



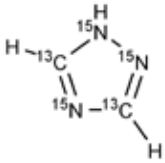
α-Tocopherol [59-02-9] *H4af*	25319-1	1 mg
MW 430.706	25319-5	5 mg
$C_{29}H_{50}O_2$	25319-10	10 mg
Purity: ≥98%		



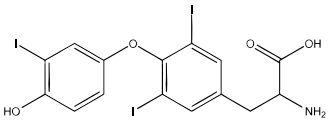
α-Tocopherol-[2H6] [113892-08-3; unlabeled:59-02-9] *H4af*	25318-2	2 mg
MW 436.7431	25318-5	5 mg
$C_{29}H_{50}O_2$	25318-10	10 mg
Isotopic Incorporation: >98% isotopic Purity: ≥98%		



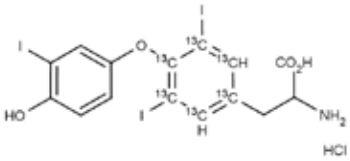
	Catalog #	Size
Triazole-[13C2,15N2] [1261170-82-4; unlabeled: 288-88-0] *H4af*	25320-1	1 mg
MW 74.0308	25320-5	5 mg
$C_2H_3N_3$		
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%		



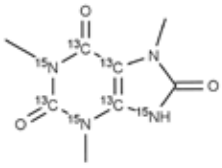
3,3',5-L-Triiodothyronine [6893-02-3] *H3af*	25322-1	1 mg
MW 650.97	25322-5	5 mg
$C_{15}H_{12}I_3NO_4$	25322-10	10 mg
Purity: ≥95%		



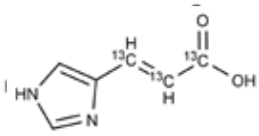
Triiodothyronine-[13C6] hydrochloride [1217473-60-3; unlabeled: 55-06-1]	25321-1	1 mg
MW 693.39	25321-5	5 mg
$C_{15}H_{13}ClI_3NO_4$	25321-10	10 mg
Isotopic Incorporation: ≥99% 13C Purity: ≥95%		



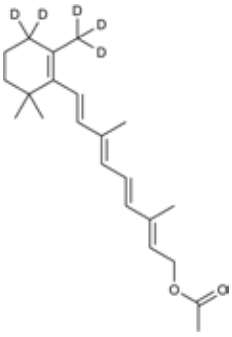
1,3,7-Trimethyluric Acid-[13C4,15N3] [1173022-55-3; unlabeled: 5415-44-1] *H4af*	25323-2	2 mg
MW 217.1407	25323-5	5 mg
$C_8H_{10}N_4O_3$		
Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥98%		



Cis-Urocanic Acid-[13C3] [1173097-34-1; unlabeled:7699-35-6] *H4af*	25324-1	1 g
MW 141.102	25324-2	2 mg
$C_6H_6N_2O_2$	25324-5	5 mg
Isotopic Incorporation: ≥99% 13C Purity: ≥98%		

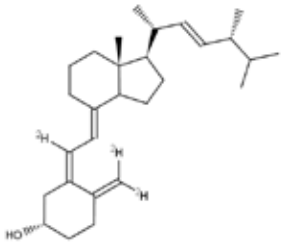


Vitamin-A-d5 Acetate [127-47-9]	25361-1	1 mg
MW 333.52	25361-5	5 mg
$C_{22}H_{27}D_5O_2$		
Purity: ≥95%		

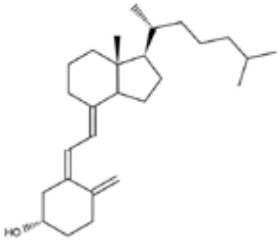


	Catalog #	Size
Vitamin B5 (Calcium Pantothenate) [137-08-6] *A2af* MW 478.548 $C_{18}H_{34}CaN_2O_{10}$ Purity: ≥97%	25327-1 25327-5 25327-10	1 mg 5 mg 10 mg
Vitamin B5-[13C6,15N2] (Calcium Pantothenate-[13C6,15N2]) [356786-94-2; unlabeled:137-08-6] *A2af* MW 486.4909 $C_{18}H_{34}CaN_2O_{10}$ Isotopic Incorporation: 99% 13C; 98% 15N Purity: ≥97%	25326-5 25326-10 25326-20	5 mg 10 mg 20 mg
Vitamin-D2 [50-14-6] *HP6af* MW 396.6484 $C_{28}H_{44}O$ Purity: ≥98%	25328-1 25328-5 25328-10	1 mg 5 mg 10 mg
Vitamin D2-[2H3] [1217448-46-8; Unlabeled: 50-14-6] *HP3af* MW 399.67 Appearance: Solid Form $C_{28}H_{44}O$	25125-1	1 mg
Vitamin D2; ethanol solution (1 mL) [50-14-6] *CHP7af* MW 396.64841 $C_{28}H_{44}O$ Purity: ≥98%	25330-0.1 25330-1	100 µg/ml 1 mg/ml

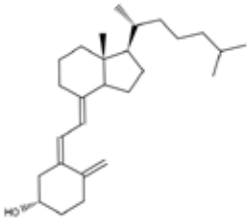
	Catalog #	Size
Vitamin D2-[2H3]; ethanol solution (1 mL) [1217448-46-8; unlabeled: 50-14-6] *CHP7af* . . .	25329-0.1	100 µg/ml
MW 399.66681	25329-1	1 mg/ml
$C_{28}H_{44}O$		
Isotopic Incorporation: 97% 2H; >2.90D/molecule Purity: ≥98%		



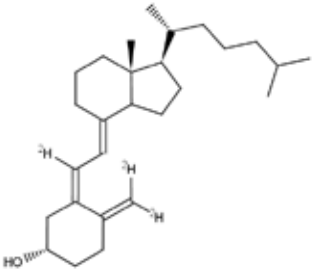
Vitamin-D3 [67-97-0] *HV7af*	25331-1	1 mg
MW 384.6376	25331-5	5 mg
$C_{27}H_{44}O$	25331-10	10 mg
Purity: ≥98%		



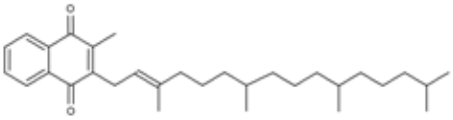
Vitamin D3; ethanol solution (1 mL) [67-97-0] *CHV5g*	25332-0.1	100 µg/ml
MW 384.6377	25332-1	1 mg/ml
$C_{27}H_{44}O$		
Purity: >98%		



Vitamin D3-[2H3]; Ethanol Solution (1ml) [8066-48-4; unlabeled: 67-97-0] *CKV3r*	25124-0.1	1 ml (100 ug/mL)
MW 387.656 Appearance: Solution	25124-1.0	1 ml (1 mg/ml)
$C_{27}H_{44}O$		
Isotopic Incorporation: 97% 2H; ≥2.90D/molecule Purity: ≥97%		

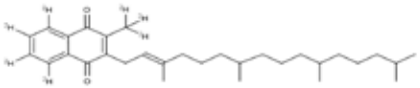


Vitamin K1 [84-80-0] *H4af*	25333-1	1 mg
MW 450.6957	25333-5	5 mg
$C_{31}H_{46}O_2$	25333-10	10 mg
Purity: ≥97% (sum of E and Z isomers)		



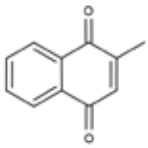
	Catalog #	Size
Vitamin K1-[2H7] [1233937-39-7; unlabeled: 84-80-0] *A3abf*	25126-1	1 mg
	25126-5	5 mg
	25126-10	10 mg

MW 457.738
$C_{31}H_{46}O_2$
Isotopic Incorporation: 99% 2H Purity: ≥97%
(sum of E and Z isomers)



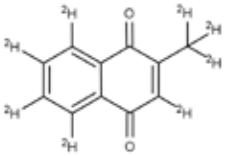
Vitamin K3 [58-27-5] *H4af*	25335-1	1 mg
	25335-5	5 mg
	25335-10	10 mg

MW 172.1799
$C_{11}H_8O_2$
Purity: ≥97%



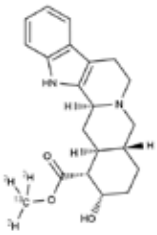
Vitamin K3-[2H8] [478171-80-1; unlabeled: 58-27-5] *H4af*	25334-50	50 mg

MW 180.2292
$C_{11}H_8O_2$
Isotopic Incorporation: 98% 2H Purity: ≥97%



Yohimbine-[13C,2H3] [1261254-59-4; unlabeled: 65-19-0] *PRS7af*	25336-5	5 mg
	25336-10	10 mg

MW 358.4538
$C_{21}H_{26}N_2O_3$
Isotopic Incorporation: >99% isotopic Purity: ≥98%



NOTES

NOTES

Microspheres & Particles

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Nucleic Acid Isolation

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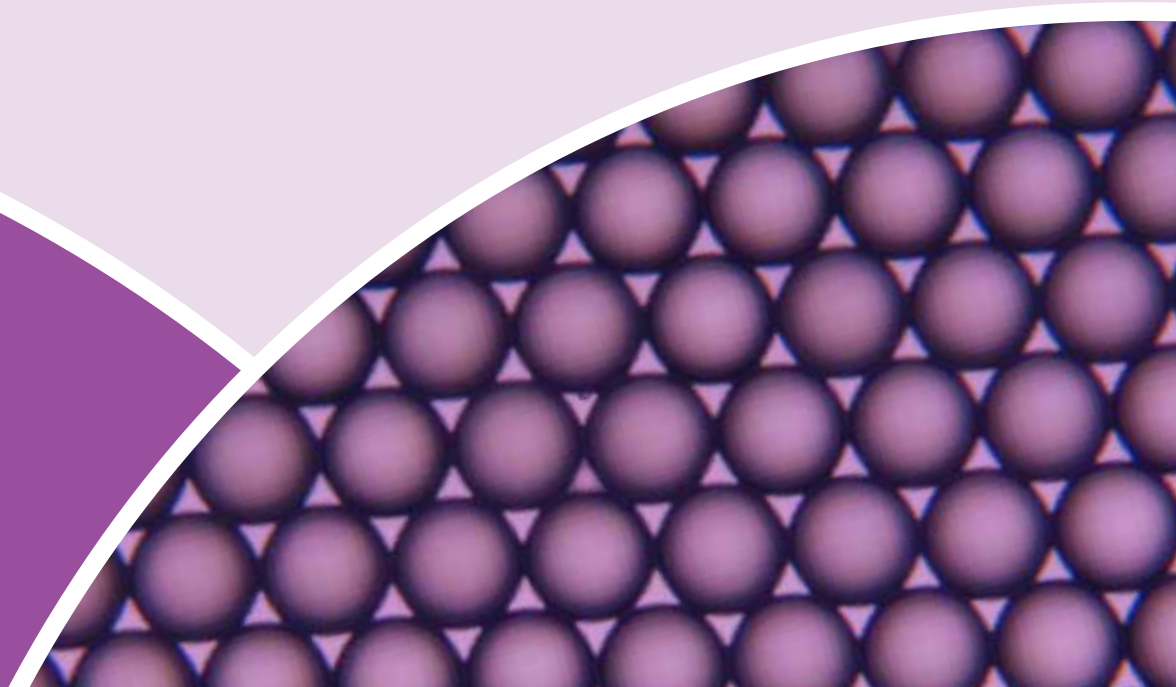


New Products

ProMag™ HC

ProMag™ HC (High Capacity) 1 µm is our latest advancement in magnetic particles. Intended for high capacity isolations, design parameters include high surface area and functionality.

ProMag™ 1 HC COOH 402

ProMag™ HC 1 Series Streptavidin 402

Vivaspin® Ultrafiltration Device. 411

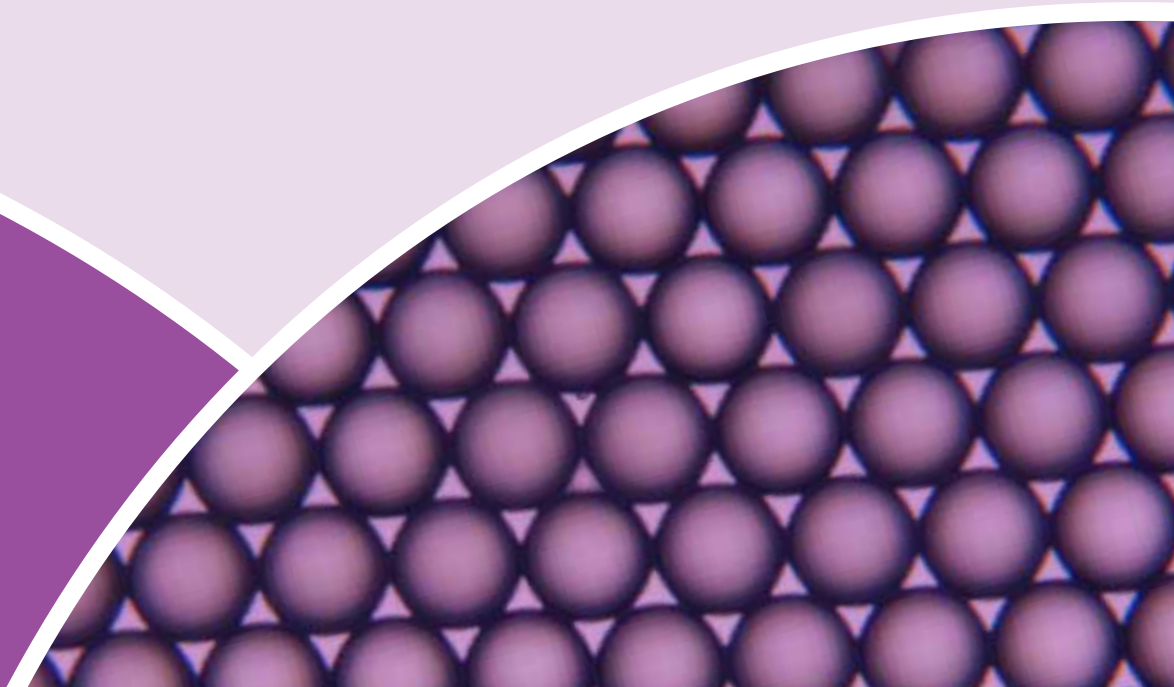
Vivaspin® Concentrators are disposable ultrafiltration devices that may be utilized for the washing and concentration of submicron (20 nm - 0.5 µm) microspheres.

ViaCheck™ 25% Viability 427

ViaCheck™ Viability and Concentration Standards are part of our extensive line of microsphere standards for instrument QC. ViaCheck™ standards mimic the light scattering characteristics of "live" and "dead" cells in the trypan blue dye exclusion method, and may be used to confirm the capabilities and verify the performance of image-based cell viability instruments.

Quantum™ QC 428

Quantum™ QC is a multi-intensity, multi-fluorescent standard that is intended for use as an in-depth tool for daily cytometer QC, and is appropriate for use with all lasers and detectors.



Polysciences, Inc. is a world leader in the development of particle-based solutions for diagnostics, bioprocessing and instrument standardization. Our capabilities in life sciences, coupled with our expertise in specialty chemicals and electronics, allow us to address the unique requirements of advanced applications in medical devices, biosensors and nanotechnology.

Polysciences offers the most comprehensive range of particle solutions in the industry. We are your source for organic, inorganic, biodegradable, magnetic, fluorescent, dyed and specific antibody and general protein coated particles in diameters spanning the range of 40nm to 10mm.

Our line of BioMag® products include superparamagnetic particles and kits that offer superior performance in the isolation and purification of nucleic acids, antibodies and other proteins. Specific cell populations may be enriched or depleted using our range of BioMag® anti-CD marker particles.

Polysciences manufactures a comprehensive range of standards for analytical instruments such as cell analyzers, particle sizers and fluorescence microscopes. Our NIST Traceable Particle Size Standards feature low coefficients of variation, which make these particles suitable for use in a wide range of applications including instrument calibration, particulate testing, filter challenge and clean room testing. Our catalog also includes SureCount™ Particle Count Standards, ViaCheck™ Viability and Concentration Controls, and a broad range of fluorescent and antibody capture beads for flow cytometric and imaging applications.

Please check our website for the latest product additions, and feel free to contact us regarding our custom services.

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General Catalog

Microspheres are routinely used in the life sciences for applications including test and assay development and bioseparations, and as instrument and process standards. Many different types of spheres are available to address the diverse and evolving needs of research and clinical studies – polymer, silica and magnetic compositions, with different surface chemistries in a range of sizes. Beads offer a large specific surface area for binding, and permit efficient capture and isolation of target. They are highly amenable to automation and miniaturization, which has been important for traditional uses, and essential for growth in developing areas such as proteomics, biophotonics and biosensing.

The pages that follow include many varieties of microspheres that are suitable for the development of test and assay reagents and standards, and also illustrate our capabilities for custom and OEM manufacturing.

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General Catalog

Polymer Microspheres

Polybead® Microspheres

Polybead® Microspheres are monodisperse polystyrene microspheres, available in sizes with nominal diameters from 50nm to 90µm. Diameters 4.5µm and larger are crosslinked with divinylbenzene (DVB). Our experienced chemists control the synthesis to provide precise monodisperse particle size distributions. These particles contain a slight anionic charge from sulfate ester.

Most of our Polybead® microspheres are packaged in economical 2.5% solids (w / v) aqueous suspensions with minimal surfactant in the final preparation. Polybead® microspheres are ideally suited for protein binding using passive adsorption techniques, and surfactant-free formulations are available on a custom basis.

Polybead® Non-functionalized Microspheres

Polybead® Microspheres *A2dmw*
Technical Data Sheets #788 & #238E

Nom. Dia.	CV%	Catalog #	Size
0.05µm	≤15	08691-10	10 ml
0.10µm	≤15	00876-15	15 ml
0.20µm	≤8	07304-15	15 ml
0.35µm	≤5	07306-15	15 ml
0.50µm	≤3	07307-15	15 ml
0.75µm	≤3	07309-15	15 ml
1.00µm	≤3	07310-15	15 ml
1.50µm	≤5	17133-15	15 ml
2.00µm	≤5	19814-15	15 ml
3.00µm	≤5	17134-15	15 ml
4.50µm	≤7	17135-5	5 ml
6.00µm	≤10	07312-5	5 ml
10.0µm	≤10	17136-5	5 ml
15.0µm	≤10	18328-5	5 ml
20.0µm	≤10	18329-5	5 ml
25.0µm	≤10	07313-5	5 ml
45.0µm	≤10	07314-5	5 ml
75.0µm	≤10	24049-5	5 ml
90.0µm	≤10	07315-5	5 ml

Polybead® Microspheres, Dry Form *A2g*
Our freeze-drying technique reduces the aggregation usually associated with dried beads. Dry material allows for the buffer of choice to be easily added.

Nom. Dia.		
1.00µm	19518-500	500 mg
1.50µm	19519-500	500 mg
3.00µm	19520-500	500 mg

Polybead® Sampler Kit I *A2dmw* . . . . . 19822-1 1 kit
Kit Contains: 5ml of standard monodisperse polystyrene microspheres (2.5% solids [w / v] in water) for each of these nominal sizes: 0.5µm, 0.75µm, 1.0µm, 2.0µm and 3.0µm. Technical Data Sheets #788 & #238E

General Catalog

	Catalog #	Size
Polybead® Sampler Kit II *A2dmw* . . . . . **Kit Contains**: A hollow fiber filter-based separation device for washing and handling small particles, plus 5ml of standard monodisperse polystyrene microspheres (2.5% solids [w / v] in water) for each of these nominal sizes: 0.1µm, 0.2µm, 0.5µm and 1.0µm. Technical Data Sheets #788 & #238E	21756-1	1 kit
Polybead® Sampler Kit III *A2dmw* . . . . . **Kit Contains**: 1ml of standard monodisperse polystyrene microspheres (2.5% solids [w / v] in water) for each of these nominal sizes: 0.05µm, 0.20µm, 0.50µm, 1.0µm, 45.0µm and 90.0µm. Technical Data Sheets #788 & #238E	16905-1	1 kit

For additional Non-functionalized Polystyrene Microspheres, see our Polyballs collection, page 413.

Polybead® Functionalized Microspheres

Polybead® Carboxylate Microspheres *A2dmw*
Polybead® Carboxylate Microspheres are monodisperse polystyrene microspheres that contain surface carboxyl groups. This allows for covalent binding of proteins to the bead surface. Packaged as 2.5% solids (w / v) aqueous suspensions. Technical Data Sheets #644 & #238C

Nom. Dia.	CV%		
0.05µm	≤15	15913-10	10 ml
0.10µm	≤15	16688-15	15 ml
0.20µm	≤8	08216-15	15 ml
0.35µm	≤5	21753-15	15 ml
0.50µm	≤3	09836-15	15 ml
0.75µm	≤3	07759-15	15 ml
1.00µm	≤3	08226-15	15 ml
2.00µm	≤5	18327-10	10 ml
3.00µm	≤5	09850-5	5 ml
4.50µm	≤7	17140-5	5 ml
6.00µm	≤10	17141-5	5 ml
10.0µm	≤10	18133-2	2 ml
20.00µm	≤15	24811-2	2 ml

Polybead® Carboxylate Sampler Kit I *A2dmw* . . . . . **Kit Contains**: 5ml of carboxylate polystyrene monodisperse microspheres (2.5% solids in water) for each of these nominal sizes: 0.5µm, 0.75µm, 1.0µm, 2.0µm and 3.0µm.	19819-1	1 kit
Polybead® Carboxylate Sampler Kit II *A2dmw* . . . . . **Kit Contains**: A hollow fiber filter-based separation device for washing and handling small particles, and 5ml of carboxylate monodisperse polystyrene microspheres (2.5% solids in water) for each of these nominal sizes: 0.1µm, 0.2µm, 0.35µm and 0.5µm.	21757-1	1 kit

See PolyLink Protein Coupling Kit for Carboxylate Microspheres (Cat. #24350), page 408.

General Catalog

	Catalog #	Size

Polybead® Amino Microspheres *A2dmw*
Polybead® Amino Microspheres are monodisperse polystyrene microspheres that contain surface primary amine groups. Protein coupling using glutaraldehyde as a coupling agent will result in protein binding 11-12 carbon atoms from the surface of the bead. Packaged as 2.5% solids (w / v) aqueous suspensions.

Nom. Dia.	CV%	Catalog #	Size
0.10µm	≤25	16586-5	5 ml
0.20µm	≤20	15699-5	5 ml
0.50µm	≤11	07763-5	5 ml
0.75µm	≤8	17144-5	5 ml
1.00µm	≤6	17010-5	5 ml
3.00µm	≤8	17145-5	5 ml
6.00µm	≤10	19118-2	2 ml

Polybead® Amino Sampler Kit *A2dmw* . . . . . 19820-1 1 kit
Kit Contains: 5ml of amino polystyrene monodisperse microspheres (2.5% solids in water) for each of these nominal sizes: 0.5µm, 0.75µm, 1.0µm and 3.0µm.

See Glutaraldehyde Kit with Hollow Fiber Filtering System, (Cat. #23964), page 408; also see Glutaraldehyde Kit for Amino and Blue Dyed Microspheres, (Cat. #19540), page 408.

Polybead® Carboxy-Sulfate Microspheres *A2dmw* . . . . . 19406-15 15 ml
Polybead® Carboxy-Sulfate Microspheres are monodisperse, surfactant-free polystyrene microspheres. We manufacture these particles to have sulfate charge groups in addition to carboxyl groups. Packaged as 2.5% solids (w / v) aqueous suspensions. **Nom. Dia.**: 1.00µm

Polybead® Sulfate Microspheres *A2dmw*
Polybead® Sulfate Microspheres are monodisperse polystyrene particles that offer a higher level of surface sulfate groups than our standard polystyrene microspheres. Packaged as 2.5% aqueous suspensions.

Nom. Dia.	Catalog #	Size
0.20µm	19402-15	15 ml
0.50µm	19403-15	15 ml
1.00µm	19404-15	15 ml
2.00µm	19405-10	10 ml

Polybead® Hydroxylate Microspheres *A2dmw*
Polybead® Hydroxylate Microspheres are monodisperse particles that contain surface hydroxyl groups. These particles are packaged in an economical suspension of 2.5% solids in water.

Nom. Dia.	Catalog #	Size
0.20µm	15717-15	15 ml
0.50µm	07762-15	15 ml
0.75µm	19128-15	15 ml
1.00µm	17142-15	15 ml
2.00µm	19129-10	10 ml
3.00µm	17143-5	5 ml

General Catalog

	Catalog #	Size
Polybead® Acrylate Microspheres *A2dmw*	18602-15	15 ml

Polybead® Acrylate Microspheres are monodisperse microspheres (2.5% solids in water) with surfaces that contain copolymers of styrene and an acrylic ester. The reactive ester sites on the polymer will furnish points for further organic reactions, which may lead to innovative forms of activation (e.g. reaction with ammonia may lead to amide formation, which may then undergo Beckmann rearrangement). **Nom. Dia.**: 1µm

If coating is your interest, please see pages 408 - 411 for our Accessory Reagents.

Polybead® Dyed Microspheres

Polysciences is the leading supplier of visibly dyed polystyrene microspheres to the latex diagnostic marketplace. Diagnostic manufacturers rely on our precisely controlled particle synthesis to ensure reproducibility in both assay design and performance. Packaged as 2.5% solids (w / v) aqueous suspensions, they are available in a variety of nominal mean diameters and colors.

Polybead® Black Dyed Microspheres *A2dmw*

Nom. Dia.		
0.20µm	24290-15	15 ml
0.50µm	24291-15	15 ml
1.00µm	24287-15	15 ml
3.00µm	24292-15	15 ml
6.00µm	24293-5	5 ml
10.0µm	24294-2	2 ml

Polybead® Polystyrene Blue Dyed Microspheres *A2dmw*

Blue Dyed Microspheres have amine groups and can be used for covalent coupling procedures using glutaraldehyde.

Nom. Dia.		
0.20µm	15706-15	15 ml
0.50µm	15709-15	15 ml
1.00µm	15712-15	15 ml
3.00µm	17138-15	15 ml
6.00µm	15715-5	5 ml
10.0µm	18138-2	2 ml

General Catalog

Polybead® Polystyrene Violet Dyed Microspheres *A2dmw*

Nom. Dia.	Catalog #	Size
0.50µm	24064-15	15 ml
0.80µm	24065-15	15 ml
1.00µm	18134-15	15 ml
3.00µm	18135-15	15 ml
6.00µm	18136-5	5 ml
10.0µm	18139-2	2 ml

Polybead® Polystyrene Red Dyed Microspheres *A2dmw*

Nom. Dia.	Catalog #	Size
0.20µm	15705-15	15 ml
0.50µm	15708-15	15 ml
1.00µm	15711-15	15 ml
3.00µm	17137-15	15 ml
6.00µm	15714-5	5 ml

Polybead® Polystyrene Yellow Dyed Microspheres *A2dmw*

Nom. Dia.	Catalog #	Size
0.20µm	15707-15	15 ml
0.50µm	15710-15	15 ml
1.00µm	15713-15	15 ml
3.00µm	17139-15	15 ml
6.00µm	15716-5	5 ml
10.0µm	18337-2	2 ml

Polybead® Blue Dyed Microsphere Sampler Kit *A2dmw* . . . . . 19821-1 4 x 5 ml
Kit Contains: 5ml of blue dyed monodisperse polystyrene microspheres (2.5% solids in water) for each of these nominal size: 0.2µm, 0.5µm, 1.0µm and 3.0µm.

General Catalog

	Catalog #	Size
Polybead® Dyed Microsphere Kit I *A2dmw* . . . . . **Kit Contains**: 1ml of dyed ~1.0µm monodisperse polystyrene microspheres (2.5% solids in water) for each of these colors: red, blue, yellow, violet and unlabeled.	16906-1	1 kit
Polybead® Dyed Microsphere Kit II *A2dmw* . . . . . **Kit Contains**: 1ml of dyed and fluorescent ~1.0µm monodisperse polystyrene microspheres (2.5% solids in water) for each of these colors: red, blue, yellow and violet, as well as Fluoresbrite® YG, BB, YO, PC Red and unlabeled.	18336-1	1 kit

Be sure to check out our Dyed Protein Coated Microspheres, pages 398 - 399.

Polybead® Carboxylate Dyed Microspheres

Polybead® Carboxylate Blue Dyed Microspheres *A2dmw*

Nom. Dia.		
0.30µm	11975-15	15 ml
0.50µm	19816-15	15 ml
1.00µm	19120-15	15 ml
3.00µm	19123-5	5 ml
6.00µm	19126-5	5 ml

Polybead® Carboxylate Red Dyed Microspheres *A2dmw*

Nom. Dia.		
0.30µm	24063-15	15 ml
0.50µm	19815-15	15 ml
1.00µm	19119-15	15 ml
3.00µm	19122-5	5 ml
6.00µm	19125-5	5 ml

Polybead® Carboxylate Orange Dyed Microspheres *A2dmw*

Nom. Dia.		
0.20µm	13369-15	15 ml
1.00µm	13368-15	15 ml

General Catalog

Polybead® Carboxylate Yellow Dyed Microspheres *A2dmw*

Nom. Dia.	Catalog #	Size
0.50µm	19817-15	15 ml
1.00µm	19121-15	15 ml
3.00µm	19124-5	5 ml
6.00µm	19127-5	5 ml

Polybead® Carboxylate Green Dyed Microspheres *A2dmw*

Nom. Dia.	Catalog #	Size
0.20µm	13371-15	15 ml
1.00µm	13370-15	15 ml

If coating is your interest, please see pages 408 - 411 for our Accessory Reagents.

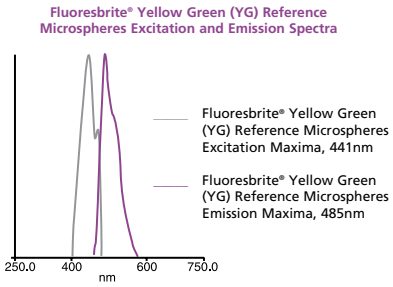
Fluoresbrite® Fluorescent Microspheres

Fluoresbrite® Microspheres

Instrument manufacturers and major diagnostic companies turn to Polysciences for our consistently superior Fluoresbrite® fluorescent polystyrene microspheres. The continued developments by our polymer chemists have resulted in products that lead the market in such applications as diagnostic assays, protein-binding assays, cell tracking and flow cytometry. These microspheres are supplied in sizes with nominal diameters from 50nm to 90µm and packaged as 2.5% solids (w / v) aqueous suspensions. Our dyes match popular filter settings: BB = DAPI, PC RED = Phycoerythrin, YG = FITC, YO = Rhodamine.

Fluoresbrite® Yellow Green (YG) Microspheres *A2dmw*

Fluoresbrite® Yellow Green (YG) Microspheres have excitation and emission spectra similar to FITC with excitation maxima of 441nm and emission maxima at 485nm. They are one of the brightest microspheres available at this wavelength and are used extensively in phagocytosis studies, flow cytometry and diagnostic assays.



Nom. Dia.	Catalog #	Size
0.05µm	17149-10	10 ml
0.10µm	17150-10	10 ml
0.20µm	17151-10	10 ml
0.50µm	17152-10	10 ml
0.75µm	17153-10	10 ml

General Catalog

Fluoresbrite® Yellow Green (YG) Microspheres, cont.

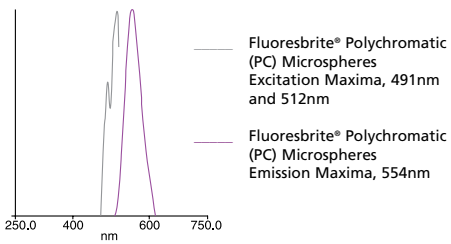
Nom. Dia.	Catalog #	Size
1.00µm	17154-10	10 ml
2.00µm	18338-5	5 ml
3.00µm	17155-2	2 ml
6.00µm	17156-2	2 ml
10.0µm	18140-2	2 ml
20.0µm	19096-2	2 ml
25.0µm	18241-2	2 ml
45.0µm	18242-2	2 ml
90.0µm	18243-2	2 ml

Fluoresbrite® Yellow Green (YG) Microspheres, Calibration Grade *A2dmw*
This special grade of Fluoresbrite® Yellow Green (YG) Microspheres has been evaluated both for particle diameter and the uniformity of the fluorescent dye distribution. Instrument manufacturers have demanded these high quality particles for their flow cytometry standards.

Nom. Dia.		
0.50µm	18859-1	1 ml
1.00µm	18860-1	1 ml
2.00µm	18604-1	1 ml
3.00µm	18861-1	1 ml
6.00µm	18862-1	1 ml

Fluoresbrite® Polychromatic Red Microspheres *A2dmw*
Fluoresbrite® Polychromatic Red Microspheres will fluoresce in different colors, depending on the light source and filters used. When viewed under a UV light source, the beads will appear as vivid orange. Microscopic viewing using a 475 - 490nm filter shows an extremely bright red fluorescence, while use of a 545 - 610nm filter yields a yellow fluorescence with excitation maxima of 491nm and 512nm and emission maxima at 554nm.

Fluoresbrite® Polychromatic (PC) Red Microspheres Excitation and Emission Spectra



Nom. Dia.		
0.50µm	19507-5	5 ml
1.00µm	18660-5	5 ml
2.00µm	19508-2	2 ml
6.00µm	19111-2	2 ml

Fluoresbrite® Multifluorescent Microspheres *A2dmw*
Offered in three sizes, each microsphere is dyed with three different fluorescent dyes with excitation maxima of 377, 517 and 588nm and emission maxima of 479, 546 and 612nm, respectively. Packaged as 2.5% solids (w / v) aqueous suspensions.

Nom. Dia.	CV%		
0.20µm	5	24050-5	5 ml
0.50µm	3	24054-5	5 ml
1.00µm	3	24062-5	5 ml

General Catalog

Fluoresbrite® PolyFluor® Microspheres *A2dmw*

Fluoresbrite® PolyFluor® Microspheres incorporate a series of polymerizable fluorescent compounds which produce fluorescence at a variety of wavelengths. These microspheres have a nominal diameter of 1.0µm. The fluorescence is uniformly distributed throughout the outer 25% of the radii of the particles. Packaged as 2.5% solids (w / v) aqueous suspensions.

	Nom. Dia.	Ex. Max. (nm)	Em. Max. (nm)	Catalog #	Size
345 Microspheres	1.0µm	285	345	24055-10	10 ml
394 Microspheres	1.0µm	339	394	24056-10	10 ml
407 Microspheres	1.0µm	362	407	24057-10	10 ml
497 Microspheres	1.0µm	355	497	24058-10	10 ml
511 Microspheres	1.0µm	470	511	24059-10	10 ml
512 Microspheres	1.0µm	439	512	24060-10	10 ml
570 Microspheres	1.0µm	548	570	24061-10	10 ml

See page 392 for our Polybead® Dyed Microsphere Kit II, and don't forget our Fluorescence Reference Standards, pages 439 - 440.

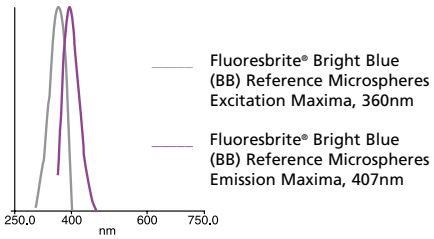
Fluoresbrite® Carboxylate Microspheres

Fluoresbrite® Carboxylate Microspheres are fluorescent monodisperse polystyrene microspheres that have carboxylate groups on their surfaces that can be activated for the covalent coupling of proteins. Polysciences' Fluoresbrite® particles are used extensively in phagocytosis and neural retrograde transport studies, and as markers for cell bound antigens. Packaged as 2.5% solids (w / v) aqueous suspensions.

See page 408 for our PolyLink Protein Coupling Kit (Cat. #24350).

Fluoresbrite® Bright Blue (BB) Carboxylate Microspheres *A2dmw*

Fluoresbrite® Bright Blue (BB) Reference Microspheres Excitation and Emission Spectra

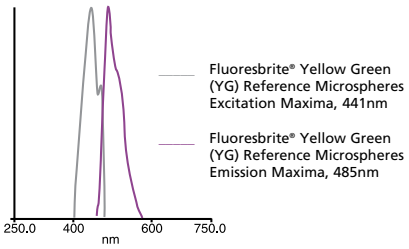


Nom. Dia.	Catalog #	Size
0.05µm	19773-10	10 ml
0.10µm	19774-10	10 ml
0.50µm	18339-10	10 ml
1.00µm	17458-10	10 ml
1.75µm	17686-5	5 ml
4.50µm	18340-5	5 ml
6.00µm	19102-2	2 ml
10.0µm	19103-2	2 ml

General Catalog

Fluoresbrite® Yellow Green (YG) Carboxylate Microspheres *A2dmw*

Fluoresbrite® Yellow Green (YG) Reference Microspheres Excitation and Emission Spectra

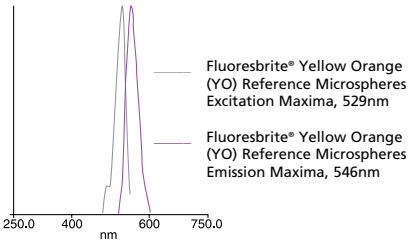


Nom. Dia.	Catalog #	Size
0.05µm	16661-10	10 ml
0.10µm	16662-10	10 ml
0.20µm	09834-10	10 ml
0.30µm	24051-10	10 ml
0.35µm	24052-10	10 ml
0.40µm	24053-10	10 ml
0.50µm	15700-10	10 ml
0.75µm	07766-10	10 ml
1.00µm	15702-10	10 ml
1.50µm	09719-10	10 ml
1.75µm	17687-5	5 ml
2.00µm	09847-5	5 ml
3.00µm	17147-5	5 ml
4.50µm	16592-5	5 ml
6.00µm	18141-2	2 ml
10.0µm	18142-2	2 ml

Fluoresbrite® Yellow Orange (YO) Carboxylate Microspheres *A2dmw*

YO has limited water solubility and some leaching may occur with rigorous washing.

Fluoresbrite® Yellow Orange (YO) Reference Microspheres Excitation and Emission Spectra

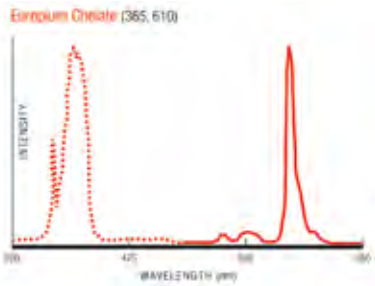


Nom. Dia.	Catalog #	Size
0.05µm	19775-10	10 ml
0.10µm	18719-10	10 ml
0.20µm	19391-10	10 ml
0.50µm	18720-10	10 ml
1.00µm	18449-10	10 ml
1.75µm	19392-5	5 ml
3.00µm	19393-5	5 ml
4.50µm	19394-5	5 ml
6.00µm	19395-2	2 ml

General Catalog

Fluoresbrite® Europium (Eu) Chelate Carboxylate Microspheres *A2dmw*

Polysciences offers Fluoresbrite® Europium (Eu) Chelate Carboxylate Microspheres in diamaters of 0.1µm, 0.2µm and 0.3µm to address the needs of individual assays, including immunochromatographic and microwell-based formats. Our Europium products offer extremely bright fluorescence and exceptional stability, in addition to well-functionalized carboxylated surfaces for the covalent attachment of ligand. **Ex. max = 365nm Em. max = 610nm** Technical Data Sheet #915



Nom. Dia.	Catalog #	Size
0.10µm	25488-1	1 ml
0.10µm	25488-5	5 ml
0.10µm	25488-10	10 ml
0.20µm	25489-1	1 ml
0.20µm	25489-5	5 ml
0.20µm	25489-10	10 ml
0.30µm	25490-1	1 ml
0.30µm	25490-5	5 ml
0.30µm	25490-10	10 ml

Fluoresbrite® Carboxylate Particles and Kits

Fluoresbrite® Carboxylate Color Range Kit I *A2dmw* . . . . . 18326-1 — 1 kit

Kit Contains: 1ml each of ~1.75µm Fluoresbrite® monodisperse polystyrene microspheres (2.5% solids [w / v] in aqueous suspension) containing dyes with these excitation maxima: 273nm, 360nm, 441nm, 529nm, 641nm and 763nm.

Fluoresbrite® Carboxylate Color Range Kit II *A2dmw* . . . . . 19839-1 — 1 kit

Kit Contains: 1ml each of ~0.50µm Fluoresbrite® monodisperse polystyrene microspheres (2.5%solids [w / v] in aqueous suspension) containing dyes with these excitation maxima: 273nm, 360nm, 441nm, 529nm, 641nm and 763nm.

Fluoresbrite® Carboxylate Size Range Kit I *A2dmw* . . . . . 21636-1 — 1 kit

Polysciences' Size Range Kits allow you to evaluate which fluorescent particle size performs optimally for your specific application. These yellow green (YG) beads are economically packaged in 1ml volumes.

Kit Contains: 1ml of Fluoresbrite® monodisperse microspheres (2.5% solids in water) for each of these nominal sizes: 0.10µm, 0.20µm, 0.50µm, 0.75µm and 1.0µm.

Fluoresbrite® Carboxylate Size Range Kit II *A2dmw* . . . . . 21637-1 — 1 kit

Polysciences' Size Range Kits allow you to evaluate which fluorescent particle size performs optimally for your specific application. These yellow green (YG) beads are economically packaged in 1ml volumes.

Kit Contains: 1ml of Fluoresbrite® monodisperse microspheres (2.5% solids in water) for each of these nominal sizes: 1.75µm, 2.0µm, 3.0µm, 4.5µm and 6.0µm.

See page 392 for our Polybead® Dyed Microsphere Kit II and page 398 for protein-conjugated versions of these products, and don't forget our Flow Cytometry Fluorescence Reference Standards, pages 428 - 430.

General Catalog

Protein Conjugated Microspheres

We offer antibodies, Protein A and Protein G covalently coupled to fluorescent YG, non-fluorescent and blue dyed polystyrene microspheres. Antibody-conjugated microspheres can be used to detect and deplete trace amounts of specific antigens in solution. Microspheres coupled with Protein A and Protein G will bind to the Fc portion of antibodies raised in most mammals. Technical Data Sheet #615

Our protein conjugated microspheres have a nominal diameter of 1.0µm and are packaged as 1.25% solids (w / v) aqueous suspensions. Proteins of your choice can be coupled to microspheres on a custom basis.

Streptavidin Conjugated Microspheres *A2dmw*
Requires Cold Pack.
Streptavidin is covalently coupled to undyed and Fluoresbrite® YG (excitation: 441nm, emission: 486nm) polystyrene microspheres. Packaged as 1.25% solids (w / v) aqueous suspensions. Technical Data Sheet #616

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	1.0µm	24162-1	1 ml
	1.0µm	24162-5	5 ml
	2.0µm	24160-1	1 ml
	2.0µm	24160-5	5 ml
	6.0µm	24158-1	1 ml
	6.0µm	24158-5	5 ml
Fluoresbrite® YG Microspheres	1.0µm	24161-1	1 ml
	1.0µm	24161-5	5 ml
	2.0µm	24159-1	1 ml
	2.0µm	24159-5	5 ml
	6.0µm	24157-1	1 ml
	6.0µm	24157-5	5 ml

Biotin Conjugated Microspheres *A2dmw*
Biotin is covalently coupled to undyed and Fluoresbrite® YG (excitation: 441nm, emission: 486nm) polystyrene microspheres. Packaged as 1.25% solids (w / v) aqueous suspensions. Technical Data Sheet #616

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	2.0µm	24172-1	1 ml
	2.0µm	24172-5	5 ml
Fluoresbrite® YG Microspheres	2.0µm	24173-1	1 ml
	2.0µm	24173-5	5 ml

Protein A Microspheres *A2dmx*
Requires Cold Pack.

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	1.0µm	17698-1	1 ml
Blue Dyed Microspheres	1.0µm	17699-1	1 ml
Fluoresbrite® YG Microspheres	1.0µm	17845-1	1 ml

General Catalog

Protein G Microspheres *A2dmx*
Requires Cold Pack.

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	1.0µm	21106-1	1 ml
Blue Dyed Microspheres	1.0µm	21105-1	1 ml
Fluoresbrite® YG Microspheres	1.0µm	21107-1	1 ml

Goat anti-Mouse IgG (H&L) Microspheres *A2dmx*
Requires Cold Pack.

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	1.0µm	17694-1	1 ml
Blue Dyed Microspheres	1.0µm	17697-1	1 ml
Fluoresbrite® YG Microspheres	1.0µm	17843-1	1 ml

Goat anti-Rabbit IgG (H&L) Microspheres *A2dmx*
Requires Cold Pack.

	Nom. Dia.	Catalog #	Size
Undyed Microspheres	1.0µm	17693-1	1 ml
Blue Dyed Microspheres	1.0µm	17696-1	1 ml
Fluoresbrite® YG Microspheres	1.0µm	17844-1	1 ml

Ligand coated silica microspheres are also available (page 400), as well as BioMag® (pages 418 - 422) and ProMag™ (pages 402 - 404) microspheres.

Silica Microspheres

Silica Microspheres, Colloidal *A2dmw*
Colloidal silica products are offered as 5% solids dispersions of amorphous silica particles in water with NaOH as a stabilizer. Like our larger silica microspheres, colloidal silica particles may be functionalized by reaction with organosilanes. Technical Data Sheet #792

	Nom. Dia.	% Solids	Catalog #	Size
Silica Microspheres (broad distribution, colloidal)	0.01µm	5	24298-10	10 ml
Silica Microspheres (colloidal)	0.05µm	5	24040-10	10 ml
	0.10µm	5	24041-10	10 ml

Silica Microspheres, Plain (Hydrophilic) *A2dmw*
Uniform, non-porous silica (SiO_2) microspheres are available in diameters of ~150nm - 5µm. These particles typically have size CVs of 10 - 15%. Inorganic supports such as silica microspheres have become increasingly important for a variety of applications, including isolation of nucleic acids, cell separation and immuno- and DNA-based assays. They offer the combined benefits of a bead platform and the unique properties of a silica substrate such as: flexible silanization chemistries, low autofluorescence and low nonspecific binding of many biomolecules. Technical Data Sheet #635

Nom. Dia.	% Solids	Catalog #	Size
0.15µm	10	24320-15	15 ml
0.3µm	10	24321-15	15 ml
0.4µm	10	24322-15	15 ml
0.5µm	10	24323-15	15 ml

General Catalog

Silica Microspheres, Plain (Hydrophilic), cont.

Nom. Dia.	% Solids	Catalog #	Size
0.7µm	10	24324-15	15 ml
0.9µm	10	24325-15	15 ml
1.0µm	10	24326-15	15 ml
1.5µm	10	24327-15	15 ml
2.0µm	10	24328-15	15 ml
2.5µm	10	24329-15	15 ml
3.0µm	10	24330-15	15 ml
4.0µm	10	24331-15	15 ml
5.0µm	10	24332-15	15 ml

Silica Microspheres, Dry *A2g*
Monodisperse silica microspheres in dry form. Available in nominal diameters ranging from: 0.3 - 6.0µm. Technical Data Sheet #635

Nom. Dia.		
0.3µm	25341-1.5	1.5 g
0.5µm	25342-1.5	1.5 g
1.0µm	25343-1.5	1.5 g
1.5µm	25344-1.5	1.5 g
2.5µm	25345-1.5	1.5 g
3.0µm	25346-1.5	1.5 g
4.0µm	25347-1.5	1.5 g
5.0µm	25348-1.5	1.5 g

Silica Microspheres, Amine *A2g*
Amine functionalized, 100% solids. Available with nominal diameters from 0.5 - 5.0µm to allow the researcher to tailor his / her product design for specific assays. Technical Data Sheet #635

Nom. Dia.		
0.5µm	24756-1	1 g
1.0µm	24757-1	1 g
5.0µm	24758-1	1 g

Silica Microspheres, Carboxyl *A2g*
Carboxylic Acid functionalized, 100% solids. Available with nominal diameters from 0.5 - 5.0µm to allow the researcher to tailor his / her product design for specific assays. Technical Data Sheet #635

Nom. Dia.		
0.5µm	24753-1	1 g
1.0µm	24754-1	1 g
5.0µm	24755-1	1 g

Silica Microspheres, Streptavidin *A2dmw*
Streptavidin coated, 1% solids. Streptavidin modified microspheres bind biotinylated ligands easily and with great affinity. Offered as a 1% dispersion in water. Available with nominal diameters from 0.5 - 5.0µm. Technical Data Sheet #635

Nom. Dia.		
0.5µm	24759-2	2 ml
1.0µm	24760-2	2 ml
5.0µm	24761-2	2 ml

Please see page 415 for our selection of Glass Beads.

General Catalog

QuantumPlex™ Multiplexing Platforms

The microsphere populations in QuantumPlex™ five-bead kits are encoded with different intensities of Starfire Red™, and microspheres in our ten-bead kits are distinguished by both fluorescence intensity and size. Starfire Red™ is a fluorescent dye with unique characteristics that make it ideal for multiplexing applications. The dye's broad excitation band allows it to be excited at a number of wavelengths, and it emits in the red channel (e.g. PE-Cy™5, APC) with very little carry-over into lower wavelengths, leaving other detectors available for determination of positive binding events via common reporters such as FITC and PE.

QuantumPlex™ kits are available with three different surfaces to accommodate the coating strategy of choice: carboxyl or streptavidin. Technical Data Sheets #PDS 215 and #PDS 235

QuantumPlex™ *A2dmw*

	Nom. Dia.	Data Points	Catalog #	Size
Carboxyl (5 dye intensities)	4.4µm	100	BLI235A-1	5 x 1 ml
	4.4µm	500	BLI235B-5	5 x 5 ml
	4.4µm	1000	BLI235C-10	5 x 10 ml
	5.5µm	100	BLI238A-1	5 x 1 ml
	5.5µm	500	BLI238B-5	5 x 5 ml
	5.5µm	1000	BLI238C-10	5 x 10 ml
Carboxyl (2 x 5 dye intensities)	4.4 & 5.5µm	200	BLI239A-1	10 x 1 ml
	4.4 & 5.5µm	1000	BLI239B-5	10 x 5 ml
	4.4 & 5.5µm	2000	BLI239C-10	10 x 10 ml
Streptavidin (5 dye intensities)	4.4µm	100	BLI215A-1	5 x 1 ml
	4.4µm	500	BLI215B-5	5 x 5 ml
	4.4µm	1000	BLI215C-10	5 x 10 ml
	5.5µm	100	BLI218A-1	5 x 1 ml
	5.5µm	500	BLI218B-5	5 x 5 ml
	5.5µm	1000	BLI218C-10	5 x 10 ml
Streptavidin (2 x 5 dye intensities)	4.4 & 5.5µm	200	BLI219A-1	10 x 1 ml
	4.4 & 5.5µm	1000	BLI219B-5	10 x 5 ml
	4.4 & 5.5µm	2000	BLI219C-10	10 x 10 ml

QuantumPlex™ SP *A2dmw*

QuantumPlex™ SP (Single Population) is useful for the development of simplex flow cytometric assays, or the optimization of attachment chemistry and assay parameters before transitioning to a multiplexed format. Technical Data Sheets #PDS 214 and #PDS 234

	Nom. Dia.	Catalog #	Size
Carboxyl	4.4µm	BLI234A-1	1 ml
	4.4µm	BLI234B-3	3 ml
	5.5µm	BLI237A-1	1 ml
	5.5µm	BLI237B-3	3 ml
Streptavidin	4.4µm	BLI214A-1	1 ml
	4.4µm	BLI214B-3	3 ml
	5.5µm	BLI217A-1	1 ml
	5.5µm	BLI217B-3	3 ml

General Catalog

QuantumPlex™M *A2dmw*

QuantumPlex™M is an innovative magnetic bead kit for multiple analyte detection research applications in flow cytometry. QuantumPlex™M results in flexible, efficient and cost-effective research. The carboxyl populations are at a concentration of ~ 1 x 10^8 beads/ml, while the streptavidin populations are at a concentration of ~ 1 x 10^6 beads/ml. Technical Data Sheets #PDS 250 and #PDS 252

	Nom. Dia.	Catalog #	Size
Carboxyl (5 dye intensities)	~6µm Magnetic	BLI250A-1	5 x 1 ml
	~6µm Magnetic	BLI250B-5	5 x 5 ml
	~6µm Magnetic	BLI250C-10	5 x 10 ml
Streptavidin (5 dye intensities)	~6µm Magnetic	BLI252A-1	5 x 1 ml
	~6µm Magnetic	BLI252B-5	5 x 5 ml
	~6µm Magnetic	BLI252C-10	5 x 10 ml

QuantumPlex™M SP *A2dmw*

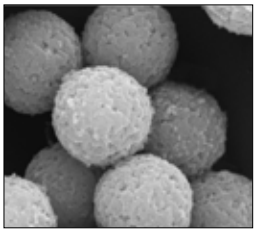
QuantumPlex™M is also available as a Single Population. Technical Data Sheets #PDS 251 and #PDS 253

	Nom. Dia.		
Carboxyl	~6µm Magnetic	BLI251A-1	1 ml
	~6µm Magnetic	BLI251B-3	3 ml
Streptavidin	~6µm Magnetic	BLI253A-1	1 ml
	~6µm Magnetic	BLI253B-3	3 ml

Magnetic Microspheres and Particles

ProMag™ HC

ProMag™ HC (High Capacity) 1 µm is our latest advancement in magnetic particles. Intended for high capacity isolations, design parameters include high surface area and functionality.



New! ProMag™ 1 HC COOH . . . . . .

Storage: Store between 4 - 8° C

Intended for high capacity isolations, design parameters include high surface area and functionality. Their magnetic separation profile ensures complete and reproducible separations. Carboxyl and Streptavidin surface chemistries support a range of research and commercial applications in the life sciences. Technical Data Sheet #PDS #745

Catalog #	Size
25992-10	10 ml
25992-25	25 ml
25992-50	50 ml
25992-100	100 ml

New! ProMag™ HC 1 Series Streptavidin . . . . . .

Storage: Store between 4 - 8° C

Intended for high capacity isolations, design parameters include high surface area and functionality. Their magnetic separation profile ensures complete and reproducible separations. Carboxyl and Streptavidin surface chemistries support a range of research and commercial applications in the life sciences. Technical Data Sheet #PDS #745

Catalog #	Size
25993-1	1 ml
25993-2	2 ml
25993-5	5 ml
25993-10	10 ml

General Catalog

ProMag™ HP

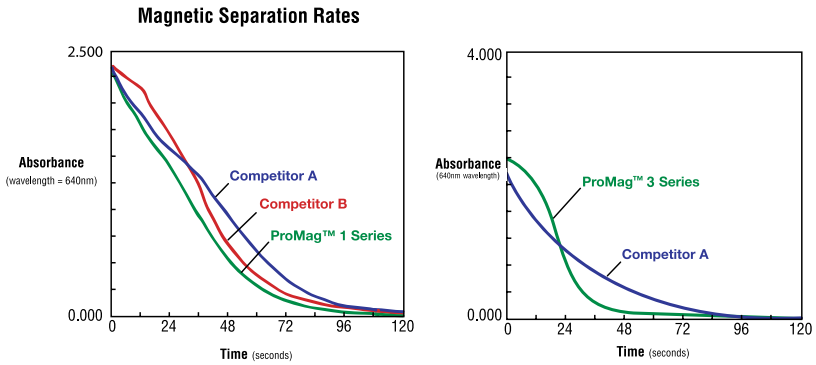
Introducing ProMag™ High Performance (HP), a new generation of magnetic microspheres engineered for use in your most sensitive assays. In addition to superior handling and coating characteristics, ProMag™ HP possess the exceptionally low background chemiluminescence and stringent iron sequestration needed to achieve highest signal-to-noise ratios. Technical Data Sheet #1003

ProMag™ HP Carboxyl *A2dmw*

	Nom. Dia.	% Solids	Catalog #	Size
3 Series	3µm	2.5	25509-5	5 ml
	3µm	2.5	25509-25	25 ml

ProMag™

Offered in 1µm and 3µm diameters, ProMag™ are polymer-based magnetic spheres that support diagnostic applications requiring highly uniform, high-binding beads and fast separation times. ProMag™ also have a proprietary surface to reduce nonspecific binding in protein-based systems. Technical Data Sheet #755



ProMag™ Carboxyl Surfactant-Free *A2dmw*

	Nom. Dia.	% Solids	Catalog #	Size
1 Series	1µm	2.5	25029-5	5 ml
	1µm	2.5	25029-25	25 ml
3 Series	3µm	2.5	86055-5	5 ml
	3µm	2.5	86055-25	25 ml

ProMag™ Amine *A2dmw*

	Nom. Dia.	% Solids	Catalog #	Size
1 Series	1µm	2.5	25511-5	5 ml
	1µm	2.5	25511-25	25 ml
3 Series	3µm	2.5	25510-5	5 ml
	3µm	2.5	25510-25	25 ml

ProMag™ Streptavidin Microspheres *A2dmw*

	Nom. Dia.	% Solids	Catalog #	Size
1 Series	1µm	1	25031-1	1 ml
	1µm	1	25031-2	2 ml
	1µm	1	25031-5	5 ml
	1µm	1	25031-10	10 ml

General Catalog

	Nom. Dia.	% Solids	Catalog #	Size
3 Series	3µm	1	86056-1	1 ml
	3µm	1	86056-2	2 ml
	3µm	1	86056-5	5 ml
	3µm	1	86056-10	10 ml

ProMag™ Protein G *A2dmw*

	Nom. Dia.	% Solids		
3 Series	3µm	1	25512-1	1 ml
	3µm	1	25512-2	2 ml
	3µm	1	25512-5	5 ml
	3µm	1	25512-10	10 ml

ProMag™ Goat anti-Mouse IgG (Fc) *A2dmw*

	Nom. Dia.	% Solids		
3 Series	3µm	1	25513-1	1 ml
	3µm	1	25513-2	2 ml
	3µm	1	25513-5	5 ml
	3µm	1	25513-10	10 ml

Amino Superparamagnetic Microparticles *A2dmw* . . . . . 18879-2 2 ml, 18879-5 5 ml

Iron-containing microparticles have a polystyrene surface which allows for passive adsorption and covalent attachment. They will respond to a magnetic field, will easily resuspend when the field is removed, and are useful in a variety of applications that require fast, gentle separation during washing and isolation procedures. These particles are packaged as 2.5% solids (w / v) aqueous suspensions. **Nom. Dia.**: ~1 - 2µm Technical Data Sheet #438

Fluorescent YG Superparamagnetic Microparticles *A2dmw* . . . . . 19133-2 2 ml, 19133-5 5 ml

Iron-containing microparticles have a polystyrene surface which allows for passive adsorption and covalent attachment. They will respond to a magnetic field, will easily resuspend when the field is removed, and are useful in a variety of applications that require fast, gentle separation during washing and isolation procedures. These particles are packaged as 2.5% solids (w / v) aqueous suspensions. **Nom. Dia.**: ~1 - 2µm Technical Data Sheet #438

BioMag®, BioMag®Plus and BioMag® Maxi

BioMag®, BioMag®Plus and BioMag® Maxi are high performance superparamagnetic microparticles widely used for the efficient separation of cells and purification of biomolecules. We offer three BioMag® particle types: BioMag®, BioMag®Plus and BioMag® Maxi. BioMag® are ~1.5µm, while BioMag®Plus are ~1.0µm and BioMag® Maxi particles are ~6µm.

BioMag® Functionalized

BioMag® Amine Magnetic Immobilization Kit *A2dmw* . . . . . 84001K-1 1 kit

The BioMag® Magnetic Immobilization Kit works with our BioMag® Amine particles to conjugate your proteins to magnetic amine particles.

Kit Contains: Unconjugated BioMag® Amine particles *(Cat. #84100)*, BioMag® Flask Separator *(Cat. #84101S)* and ultrapure glutaraldehyde for conjugating your protein.

General Catalog

	Concentration	Stoichiometry	Catalog #	Size
BioMag® Amine *A2dmw*				
	50 mg/ml	240 µmol/g	84100-10	10 ml
	50 mg/ml	240 µmol/g	84100-100	100 ml

BioMag®Plus Amine *A2dmw* . . . . . 86001-10 10 ml
86001-100 100 ml

BioMag®Plus Amine particles offer a high level of amine functionality on magnetically responsive particles. Covalent attachment of proteins can be done via a reaction with glutaraldehyde. Provided as a suspension at 50 mg/ml. Technical Data Sheet #617

BioMag®Plus Amine Protein Coupling Kit *HOV6d* . . . . . 86000-1 1 kit

The BioMag®Plus Amine Protein Coupling Kit provides all reagents necessary for the covalent attachment of proteins to BioMag®Plus Amine superparamagnetic particles. Contents of kit are sufficient for five coupling reactions.

Kit Contains: 25ml BioMag®Plus Amine *(Cat. #86001)*, 2 x 10ml glutaraldehyde (EM Grade, 25%), 5 x 50ml conical centrifuge tubes, BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)*, 2 x 125ml Pyridine Wash Buffer (PWB), 2 x 125ml Quenching Solution (1M Glycine, pH 8.0) and 125ml Wash Buffer. Technical Data Sheet #617

	Concentration	Stoichiometry	Catalog #	Size
BioMag® Carboxyl *A2dmw*				
	20 mg/ml	240 µmol/g	84125-10	10 ml
	20 mg/ml	240 µmol/g	84125-100	100 ml

BioMag®Plus Carboxyl *A2dmw* . . . . . 86011-10 10 ml

BioMag®Plus Carboxyl superparamagnetic particles are provided for the covalent attachment of proteins using carbodiimide (EDAC method). Provided as a suspension at 20 mg/ml. Technical Data Sheet #618

BioMag®Plus Carboxyl Protein Coupling Kit *HO6bd* . . . . . 86010-1 1 kit

The BioMag®Plus Carboxyl Protein Coupling Kit includes all of the reagents necessary for the covalent attachment of proteins to BioMag®Plus Carboxyl superparamagnetic particles. Contents of kit are sufficient for five coupling reactions.

Kit Contains: 2.5ml BioMag®Plus Carboxyl *(Cat. #86011)*, 0.10g EDAC (1-ethyl-3-(3-dimethylaminopropyl)carbodiimide), 5 x 15ml conical centrifuge tubes, BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)*, 2 x 175ml 0.05M MES buffer (pH 5.2), 25ml Quenching Solution (1.0M Glycine, pH 8.0) and 125ml Wash Buffer. Technical Data Sheet #618

BioMag® Maxi, ~6µm *A2dmw*

BioMag® Maxi are irregularly shaped iron oxide particles of ~6µm in size. It has been shown that larger, denser particles are more efficient in immunomagnetic capture assays, especially in viscous solutions. Technical Data Sheet #722

	Concentration	Catalog #	Size
Amine	50 mg/ml	84140-10	10 ml
Carboxyl	20 mg/ml	84130-10	10 ml

BioMag® Binding Proteins

BioMag® Streptavidin *A2dmw*

Requires Cold Pack.

	Concentration	Catalog #	Size
	5 mg/ml	84660-5	5 ml
	5 mg/ml	84660-50	50 ml

General Catalog

	Catalog #	Size
BioMag®Plus Streptavidin *A2dmw*	86031-10	10 ml

Requires Cold Pack.
BioMag®Plus Streptavidin Particles are a suspension of superparamagnetic particles approximately 1µm in size, covalently attached to streptavidin. BioMag®Plus Streptavidin allows for capture of biotinylated oligonucleotides, proteins, dNTPs and other molecules. Provided as a suspension at ~5mg per ml. Technical Data Sheet #621

BioMag®Plus Streptavidin / Biotin Binding Starter Kit *A2dmw*	86030-1	1 kit

Requires Cold Pack.
This kit contains all reagents needed for the attachment of biotinylated proteins to BioMag®Plus superparamagnetic particles. Contents of kit are sufficient for 5 coupling reactions.

Kit Contains: 5ml of BioMag®Plus Streptavidin *(Cat. #86031)*, 250ml Coupling / Wash Buffer, BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)* and 5 x 15ml conical centrifuge tubes.
Technical Data Sheet #621

BioMag® Streptavidin, Nuclease-Free *A2dmw*	8MB4804-10	10 ml
	8MB4804-25	25 ml
	8MB4804-1	100 ml

Requires Cold Pack.
BioMag® Streptavidin, Nuclease-Free is a suspension of BioMag® Streptavidin particles for immobilizing biotinylated nucleic acids.

BioMag® Biotin *A2dmw*
Requires Cold Pack.

	Concentration		
	5 mg/ml	84640-5	5 ml

BioMag® Proteins A & G *A2dm*
Requires Cold Pack.

	Concentration		
Protein A	5 mg/ml	84600-2	2 ml
	5 mg/ml	84600-10	10 ml
Protein G	5 mg/ml	84605-2	2 ml
	5 mg/ml	84605-10	10 ml

BioMag®Plus Concanavalin A *A2dmw*	86057-3	3 ml
	86057-10	10 ml

Requires Cold Pack.
BioMag®Plus Concanavalin A (Con A) coated microparticles provide a convenient means for isolating mannosyl and glucosyl-containing glycoproteins and polysaccharides from serum or cell lysate, or for investigating other lectin / glycan-mediated processes. The BioMag®Plus magnetic particle format provides high surface area and permits easy and efficient separations. Technical Data Sheet #766

BioMag®Plus Wheat Germ Agglutinin *A2dmw*	86054-3	3 ml
	86054-10	10 ml

Requires Cold Pack.
The unique saccharide-binding properties of plant lectins, such as wheat germ agglutinin (WGA), have made them useful for the study of glycosylated proteins. Lectins have been used in cell adhesion studies, to effect lymphocyte activation, and to explore carbohydrate-based therapeutics.

Our WGA-coated BioMag®Plus microparticles provide a convenient means for isolating N-acetylglucosamine-containing glycoproteins from cell lysate or to explore other lectin / glycan-mediated processes. The BioMag®Plus magnetic particle format provides high surface area, and permits easy and efficient separations. Technical Data Sheet #759

General Catalog

BioMag® Secondary Antibody Particles

BioMag® Secondary Antibody Particles *A2dmw*
Requires Cold Pack.

	Concentration	Binding Capacity	Catalog #	Size
Goat anti-Human IgG	1 mg/ml	>0.10 mg/ml	84320-50	50 ml
Goat anti-Human IgG (Fc Specific)	5 mg/ml	>0.20 mg/ml	84324-50	50 ml
Goat anti-Human IgM	1 mg/ml	>0.15 mg/ml	84325-50	50 ml
Goat anti-Mouse IgG	1 mg/ml	>0.20 mg/ml	84340-50	50 ml
	1 mg/ml	>0.20 mg/ml	84340-500	500 ml
Goat anti-Mouse IgG (Fc Specific)	5 mg/ml	>0.15 mg/ml	84344-50	50 ml
	5 mg/ml	>0.15 mg/ml	84344-500	500 ml
Goat anti-Mouse IgM	1 mg/ml	>0.20 mg/ml	84350-50	50 ml
	1 mg/ml	>0.20 mg/ml	84350-500	500 ml
Goat anti-Rabbit IgG	1 mg/ml	>0.20 mg/ml	84300-50	50 ml
	1 mg/ml	>0.20 mg/ml	84300-500	500 ml
Goat anti-Rat IgG	1 mg/ml	>0.15 mg/ml	84330-50	50 ml
	1 mg/ml	>0.15 mg/ml	84330-500	500 ml
Goat anti-Rat IgG (Fc Specific)	5 mg/ml	>0.20 mg/ml	84334-50	50 ml
	5 mg/ml	>0.20 mg/ml	84334-500	500 ml
Goat anti-Rat IgM	5 mg/ml	>0.10 mg/ml	84335-50	50 ml
	5 mg/ml	>0.10 mg/ml	84335-500	500 ml

BioMag®Plus Secondary Antibody Particles & Kits

BioMag®Plus Goat anti-Mouse IgG Secondary Antibody Particles *A2dmw* . . . . . 86021-50 50 ml
Requires Cold Pack.
Concentration: 1 mg/ml **Binding Capacity**: >0.20 mg/ml Technical Data Sheet #619

BioMag®Plus Goat anti-Mouse IgG Particle Antibody Coupling Starter Kit *A2dmw* . . 86020-1 1 kit
Requires Cold Pack.
This kit includes all of the reagents for the attachment of antibodies to BioMag®Plus superparamagnetic particles. Contents of the kit are sufficient for five binding reactions.
Kit Contains: 25ml BioMag®Plus anti-Mouse IgG *(Cat. #86021)*, 250ml Coupling / Wash Buffer, 5 x 15ml conical centrifuge tubes and BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)*. Technical Data Sheet #619

BioMag® Dextran-coated Charcoal

BioMag® Dextran-coated Charcoal *A2dmw*

	Concentration	Catalog #	Size
Charcoal	5 mg/ml	84510-100	100 ml
Charcoal Concentrate	50 mg/ml	84555-1	1000 ml

BioMag® Superparamagnetic Iron Oxide

BioMag® Superparamagnetic Iron Oxide, ~10µm *A2dmw* . . . . . 84200-10 10 ml
This is a suspension of iron oxide magnetic particles approximately 10µm in size. Suspension is supplied in deionized water. Magnetization: 25 - 35 EMU / gram (EMU=electromagnetic units) measured at a field of 1000 gauss. Concentration: 50mg/ml

Please see page 416 for our other magnetic iron powder and page 415 for iron oxide particles.

General Catalog

Accessory Reagents & Companion Products

Protein Coupling Kits

	Catalog #	Size
PolyLink Protein Coupling Kit *HO6bf*	24350-1	1 kit

The PolyLink Protein Coupling Kit enables researchers to quickly couple proteins to carboxylated microspheres in two hours or less. The procedure provided with the kit has been optimized for polymer microspheres 1µm or larger.

Kit Contains: 55ml Coupling Buffer, 45ml Wash / Storage Buffer and 0.75g EDAC. Each kit is sufficient for 50 coupling reactions of 200-500g of protein per reaction. *No beads are included in this kit.* Technical Data Sheet #644

PolyLink Kit with Hollow Fiber Filtering System *BVW7dw*	24818-1	1 kit

The PolyLink Kit with Hollow Fiber Filtering System includes a hollow fiber separation device to aid in the washing and isolation steps. Microspheres of 0.1µm - 0.5µm diameter can be handled easily without laborious high speed centrifugation techniques. For microspheres less than 0.1µm, use the PolyLink Protein Coupling Kit *(Cat. #24350)* with Vivaspin® ultrafiltration devices *(Cat. #BLIAA022-5)* or dialysis tubing. *No beads are included in this kit.* Technical Data Sheets #606 and #853

Glutaraldehyde Kit for Amino Beads & Blue Dyed Beads *BIX7dw*	19540-1	1 kit

This kit contains 3 x 225ml Phosphate Buffered Saline, 2 x 10ml ampoules 25% EM Grade Glutaraldehyde, 60ml 0.2M Ethanolamine in Phosphate Buffered Saline, 60ml Bovine Serum Albumin solution, 60ml Storage Buffer and a labeled mixing and storage bottle. *No beads are included in this kit.* Technical Data Sheets #238G and #410

Glutaraldehyde Kit with Hollow Fiber Filtering System *BIX7dw*	23964-1	1 kit

This kit includes a hollow fiber separation device to aid in the washing and isolation steps. Microspheres of 0.1µm - 0.5µm diameter can be handled easily without laborious high speed centrifugation techniques. Device may not be suitable for microspheres smaller than 0.1µm. For microspheres smaller than 0.1µm, use the Glutaraldehyde Kit for Amino Beads & Blue Dyed Beads *(Cat. #19540)* along with with Vivaspin® ultrafiltration devices *(Cat. #BLIAA022-5)* or dialysis tubing. *No beads are included in this kit.* Technical Data Sheets #238G and #606

Microsphere Coating Reagents

DEPC-Carbodiimide (EDAC) *Af*	BLI5288-1 BLI5288-5	1 g 5 g

EDAC is a zero-length crosslinker that is routinely used for the covalent binding of amine-containing ligands to carboxylated microspheres. Technical Data Sheet #911

Glutaraldehyde, EM Grade, 25% [111-30-8] *HOV6d*	BLI1909-10	10 x 10 ml

Glutaraldehyde, EM Grade, 25%, is a homobifunctional linker that is suitable for binding amine-containing ligands to amine-modified beads. We supply EM (electron microscopy) grade glutaraldehyde in ampoules to ensure the highest activity. Each ampoule is fitted with an ampoule cracker for added safety. Technical Data Sheet #911

Buffers & Solutions

Bead Coupling & Storage Buffers *Ad*

Polysciences' Bead Coupling and Storage Buffers are ready-to-use buffers that are available in a variety of pH levels (4.5 to 9.0). They can be used as coupling or wash buffers for plain, dyed or functionalized polymer microspheres. Technical Data Sheet #794

General Catalog

	pH Level	Catalog #	Size
Coupling Buffer	4.5	24976-250	250 ml
	4.5	24976-500	500 ml
	4.5	24976-1000	1000 ml
	4.5	24976-2000	2000 ml
	6.0	24977-250	250 ml
	6.0	24977-500	500 ml
	6.0	24977-1000	1000 ml
	6.0	24977-2000	2000 ml
	7.4	24974-250	250 ml
	7.4	24974-500	500 ml
	7.4	24974-1000	1000 ml
	7.4	24974-2000	2000 ml
	9.0	24978-250	250 ml
	9.0	24978-500	500 ml
	9.0	24978-1000	1000 ml
	9.0	24978-2000	2000 ml
Storage Buffer	7.4	24979-250	250 ml
	7.4	24979-500	500 ml
	7.4	24979-1000	1000 ml
	7.4	24979-2000	2000 ml
	8.5	24975-250	250 ml
	8.5	24975-500	500 ml
	8.5	24975-1000	1000 ml
	8.5	24975-2000	2000 ml

Bead Solution *Ad* . . . . . 24973-500 500 ml
24973-1000 1000 ml
24973-2000 2000 ml

Polysciences' Bead Solution is a ready-to-use aqueous suspending solution for the dilution and/or storage of your uncoated plain, dyed or functionalized polymer microspheres (both carboxylated or aminated). An antimicrobial agent deters microbial contamination, and stabilizers promote suspension dispersity, peace of mind and harmonious accord in the laboratory. Technical Data Sheet #793

Surfactants

Triton® X-100 Nonionic Surfactant *HV5g* . . . . . BLI4605-10 10 g

A nonionic surfactant, Triton® X-100 is often used in the storage buffers of coated bead suspensions. Very low concentrations may be used in wash or binding buffers if needed (e.g. 0.0005%). Technical Data Sheet #912

Tween® 20 Nonionic Surfactant *A2g* . . . . . BLI6110-10 10 g

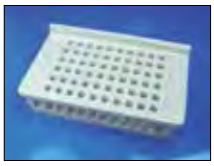
A nonionic surfactant, Tween 20® is often used in the storage buffers of coated bead suspensions. Very low concentrations may be used in wash or binding buffers if needed (e.g. 0.0005%). Technical Data Sheet #912

Sodium Dodecyl Sulfate (SDS) Anionic Surfactant . . . . . BLI3945-10 10 g

SDS is an anionic surfactant, which will decrease polymer bead hydrophobicity and can additionally participate in charge stabilization of the suspension. SDS is a more rigorous surfactant than is commonly used in uncoated polymer bead preparations. Technical Data Sheet #912

General Catalog

Magnetic Separators

	Catalog #	Size
BioMag® 12 x 75mm Test Tube Separator The BioMag® 12 x 75mm Test Tube Separator holds sixty 12 x 75mm tubes for radio-immunoassays or other applications. BioMag® particles pellet at the bottom of the test tube. Technical Data Sheets #573 and #796 	84104S-1	1 unit
BioMag® 15ml / 50ml Tube Separator The BioMag® 15ml / 50ml Tube Separator holds five 15ml tubes and three 50ml tubes for cell storing, small-scale ligand attachment and other applications. Technical Data Sheets #572 and #796	84102S-1	1 unit
BioMag® Flask Separator For use with tissue culture flasks, each BioMag® Flask Separator measures 12.5 x 6cm. For more concentrated solutions of BioMag® particles, two units are recommended, one on each side of the flask. Technical Data Sheets #571 and #796	84101S-1	1 unit
BioMag® MultiSep Magnetic Separator The BioMag® MultiSep Magnetic Separator is well suited for labs that do not need to perform simultaneous multiple magnetic particle separations and is a convenient and economical alternative to having a specific magnetic separator for each tube size. The MultiSep can be used with 50ml, 15ml or 1.5ml centrifuge tubes. Technical Data Sheets #791 and #796	85200-1	1 unit
BioMag® Multi-6 Microcentrifuge Tube Separator This separator holds six 1.5ml microcentrifuge tubes for separations of 20 - 500µl. Technical Data Sheets #576 and #796	8MB4111S-1	1 unit
BioMag® Multi-32 Microcentrifuge Tube Separator The BioMag® Multi-32 Microcentrifuge Tube Separator is suitable for molecular biology applications of 0.5 - 1.5ml. Sixteen tubes in the inner row are magnetically separated while the sixteen in the outer row are held outside the field for mixing and pipetting. Technical Data Sheets #574 and #796	84106S-1	1 unit

General Catalog

	Catalog #	Size
BioMag® Solo-Sep Microcentrifuge Tube Separator The BioMag® Solo-Sep Microcentrifuge Tube Separator holds one 1.5ml microcentrifuge tube for molecular biology separations of 20 - 500µl. Technical Data Sheets #577 and #796	8MB4112S-1	1 unit
BioMag® 96-Well Plate Separator The BioMag® 96-Well Plate Separator is suitable for most 96-well plate applications. Particles pellet at the bottom of the plate. Technical Data Sheets #575 and #796	8MB4109S-1	1 unit
BioMag® 96-Well Plate Side Pull Magnetic Separator The BioMag® 96-Well Plate Side Pull Magnetic Separator is designed to work with plates that allow magnetic pins to fit between the wells. This allows BioMag® and BioMag®Plus superparamagnetic particles to be pulled to the side of the wells, giving better access to the bottom of the wells for more complete fluid removal and less chance of particle aspiration. Consists of 24 permanent Neodymium-Iron-Boron rod magnets. Each magnet addresses four wells of a 96-well plate. Technical Data Sheets #575 and #796	85072S-1	1 unit
Neodymium Iron Magnet This rare earth magnet is a Neodymium-Iron-Boron (NdFeB) block magnet. It measures 1" square and 0.5" thick.	19772-1	1 unit
New! Vivaspin® Ultrafiltration Device Vivaspin® Concentrators are disposable ultrafiltration devices that may be utilized for the washing and concentration of submicron (20 nm - 0.5 µm) microspheres. Technical Data Sheet #PDS #AA022	BLIAA022-5	5 units

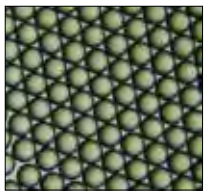
General Catalog

Additional Microspheres

Biodegradable Microspheres

Poly(Lactic Acid-co-Glycolic Acid) Uniform Dry Microspheres *HK5cd*

We offer microspheres comprised of two PLGA polymer ratios (50:50 and 75:25 Lactic Acid:Glycolic Acid) in three narrow sizes (75µm, 100µm and 120µm; 5 - 10% CVs). These highly uniform particle populations serve as excellent models for controlled degradation rate measurements, and for the development of prototype scaffolds or devices. Lyophilized to resist biodegradation. Custom quotations on other PLGA microparticles, alternative biodegradable polymer family types or microparticles with specific active components are available upon request. Technical Data Sheet #858



Composition - LA/GA	Size Range	Mol. Weight	Catalog #	Size
50:50	70 - 80µm	~150,000	25401-100	100 mg
50:50	70 - 80µm	~150,000	25401-250	250 mg
50:50	70 - 80µm	~150,000	25401-500	500 mg
50:50	95 - 105µm	~150,000	25402-100	100 mg
50:50	95 - 105µm	~150,000	25402-250	250 mg
50:50	95 - 105µm	~150,000	25402-500	500 mg
50:50	115 - 125µm	~150,000	25403-100	100 mg
50:50	115 - 125µm	~150,000	25403-250	250 mg
50:50	115 - 125µm	~150,000	25403-500	500 mg
75:25	70 - 80µm	~90,000	25398-100	100 mg
75:25	70 - 80µm	~90,000	25398-250	250 mg
75:25	70 - 80µm	~90,000	25398-500	500 mg
75:25	95 - 105µm	~90,000	25399-100	100 mg
75:25	95 - 105µm	~90,000	25399-250	250 mg
75:25	95 - 105µm	~90,000	25399-500	500 mg
75:25	115 - 125µm	~90,000	25400-100	100 mg
75:25	115 - 125µm	~90,000	25400-250	250 mg
75:25	115 - 125µm	~90,000	25400-500	500 mg

Polymer Microspheres

Polystyrene Beads, Large *A2g*

Our crosslinked Polystyrene Beads are larger than Polybeads®, yet smaller than Polyballs. We offer a full size range of polystyrene beads and can offer particles of intermediate sizes on a custom basis. Technical Data Sheet #856

Size Range	Catalog #	Size
106 - 125µm	19824-1	1 g
200 - 300µm	19825-1	1 g
355 - 425µm	19826-1	1 g
500 - 600µm	21392-1	1 g

General Catalog

Polyballs *A2g*

Uniform spheres with a smooth surface unless noted otherwise. Technical Data Sheet #404

	Density	Catalog #	Size
Polyamide 6/6 (Nylon), 1/16″ Diameter	~1.19 g/cc	08295-100	100 balls
Polyethylene, 3/8″ Diameter, Hollow	~0.53 g/cc	19529-100	100 balls
Polypropylene, 1/4″ Diameter	~0.92 g/cc	16026-100	100 balls
Polystyrene, 1/8″ Diameter, Etched Surface	~1.05 g/cc	17175-100	100 balls
Polystyrene, 1/8″ Diameter, for Biological Applications	~1.05 g/cc	18547-100	100 balls
Polystyrene, 1/4″ Diameter	~1.05 g/cc	19827-100	100 balls
Polystyrene, 1/4″ Diameter, Etched Surface	~1.05 g/cc	16730-100	100 balls
	~1.05 g/cc	16730-500	500 balls
Polystyrene, 1/4″ Diameter, for Biological Applications	~1.05 g/cc	18548-100	100 balls
Teflon, 1/8″ Diameter	~2.14 g/cc, chemically resistant	17649-100	100 balls
Teflon, 1/4″ Diameter	~2.14 g/cc, chemically resistant	17650-100	100 balls

Polyballs, Modified *A2g*

Our high quality Polyball polymer spheres are offered with modified surfaces to allow covalent coupling of biomolecules. One version is blue dyed for easier modification. Technical Data Sheet #404

	Density		
Polystyrene 1/8″ Diameter, Carboxylate	~1.05 g/cc	19841-50	50 balls
Polystyrene 1/4″ Diameter, Carboxylate	~1.05 g/cc	19840-50	50 balls
Polystyrene 1/4″ Diameter, Blue Dyed	~1.05 g/cc	19842-50	50 balls

Polybead® Hollow Microspheres *A2dm*

Polybead® Hollow Microspheres are spherical styrene / acrylic beads supplied in suspension. A relatively dense shell of a polystyrene-based copolymer is formed around a void in the particle. Sphere voids are water-filled in the as-supplied 5% solids aqueous suspension, and the water-filled particle will have an effective density near 1.0 g/cm^3. Water is lost from the void upon drying since the particles are slightly porous. This results in a hollow particle with a shell approximately 0.10µm thick. Surfactants on the surface of the microspheres help stabilize the particles. Technical Data Sheet #784

	Nom. Dia.		
	0.40µm	23567-10	10 ml
	0.55µm	23568-10	10 ml
	1.00µm	23569-10	10 ml

Polybead® Poly(methyl methacrylate) Microspheres *A2dm*

Poly(methyl methacrylate) or PMMA is less hydrophobic than polystyrene and should show reduced nonspecific protein and peptide binding. The density of these beads, 1.19 g/cc, is considerably higher than that of polystyrene beads, making them easier to concentrate by centrifugation. The beads are not free of surfactant and contain surface carboxylic acid groups at higher concentration than the standard Polybead® Polystyrene Carboxylate Microspheres. Technical Data Sheet #1001

	Size Range	% Solids		
Monodisperse	0.30 µm	2.5	12083-10	10 ml
Broad Distribution	1 - 10 µm	5	19130-10	10 ml
PMMA Nonionic Surfactant	0.08 - 013 µm	5	23571-10	10 ml
PMMA Anionic Surfactant	0.08 - 0.09 µm	5	23570-10	10 ml

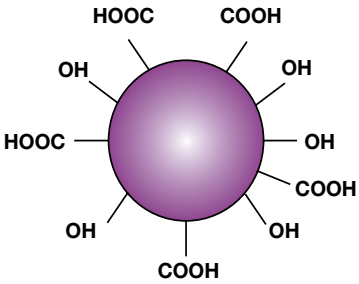
General Catalog

	Catalog #	Size
Polybead® Crosslinked Melamine Particles *A2dm*	23579-5	5 ml

Crosslinked by acid-catalyzed reaction with formaldehyde, the Polybead® Crosslinked Melamine Particles have a much higher density (1.51 g/cc) than polystyrene, are hydrophilic with amine and methylolamine groups and, being crosslinked, are not noticeably swelled by organic solvents. They can be lyophilized and then redispersed in water. Supplied as a suspension of 2.5% solids in water. **Nom. Dia.**: 1µm Technical Data Sheet #920

DispersEZ-300 [9002-84-0] *H4g*

A novel patented class of polytetrafluoroethylene particles, our unique DispersEZ particles have chemically treated surfaces to orient stabilizing polar moieties (both hydroxyl and carboxylic acid groups) to the exterior of the particle. These molecules, which are chemically grafted to the PTFE surface, allow the particles to disperse easily in both aqueous and solvent media without the need for added surfactants or stabilizers. The carboxyl and hydroxyl moieties on the surface of the DispersEZ particles act as synthetic handles to which a variety of chemical species can be attached. Technical Data Sheet #1000



Mean Particle Size	Surface Area	Surfactant Demand	Surface Reactivity	Catalog #	Size
200 - 300nm	8m²/g (BET surface area measurement)	None (self-stabilized added surfactant)	High (concentration of accessible reactive sites versus traditional PTFE beads)	24339-50	50 g

Microdispers [9002-84-0] *H4g*

Microdispers are polytetrafluoroethylene (PTFE) particles provided in dry powder form. These particles require far less added dispersant than traditional PTFE particles to form stable dispersions and are useful for many applications including coatings, gloss reducers and coating additives that impact water pickup or surface energy. With good powder flow properties, these particles are easily compounded in a number of thermoplastic matrices with appropriate heat / shear mixing. Technical Data Sheet #1000

Mean Particle Size	Catalog #	Size
200 - 300nm	24333-100	100 g
3000nm (<10% of particle size distribution is above 10µm)	24334-100	100 g
8000nm	24336-100	100 g

	Catalog #	Size
Phenolic Beads, Hollow	17806-100	100 g

Hollow Phenolic Beads are excellent for use in a variety of industrial applications. They are lightweight, chemically inert and mechanically strong. They can be excellent adhesives, gap filling formulations, sandable putties, syntactic foams and molded and laminated structures that must be lightweight and strong. Technical Data Sheet #783

	Catalog #	Size
Poly(ethyl methacrylate) Beads [9003-42-3] *A2g*	03197-250	250 g

MW 50,000 Tg 65° C TSCA

These Poly(ethyl methacrylate) Beads are made of a tough methacrylate resin and are available in a size range of 140 - 220µm. Technical Data Sheet #920

	Catalog #	Size
Poly(4-iodostyrene / styrene / divinylbenzene) ~58:40:2 [72330-89-3] *U4g*	18148-5	5 g

Iodinated, crosslinked beads that can be further derivatized. 200 - 400 mesh Technical Data Sheet #920

Polypropylene, Chromatographic Grade [9003-07-0] *A2g*

TSCA $[-CH_2CH(CH_3)-]_n$

Widely used polyolefin and soluble in chlorinated hydrocarbons, aromatic hydrocarbons and isoamyl acetate. Technical Data Sheet #920

	Size Range	Catalog #	Size
Chromatographic Grade 25 - 85µm, mp 165°, Tg -13°	25 - 85µm	04342-100	100 g
Chromatographic Grade 150µm	150µm	06068-100	100 g

General Catalog

		Catalog #	Size
Poly(styrene / divinyl benzene) [9003-70-7] *A2g* These beads are used for preparation of crosslinked poly(chloromethylstyrene) Merrifield resins and other functionalized beads. 200-400 mesh TSCA Technical Data Sheet #920			
	ratio		
	92:8	04022-100	100 g
	98:2	16724-100	100 g
Poly(tetrafluoroethylene) [9002-84-0] *A2g* . . . . . . This inert polymer has a nominal 35µm diameter (Teflon® 7A) Technical Data Sheet #920		08816-100	100 g
Poly(4-vinylpyridine / divinylbenzene) [19017-40-7] *U7g* . . . . . . These beads are used as an absorbent and in ion-exchange resin. Technical Data Sheet #920		06579-10	10 g

Glass Beads

Glass Beads *A2g*
Polysciences has a full size range of glass beads that are manufactured from specially selected soda lime glass with a density of ~2.48 g/cm^3. Glass beads are supplied dry. Technical Data Sheets #758 and #857

	Size Range		
	3 - 10µm	07666-1	1 g
	10 - 30µm	07668-1	1 g
	30 - 50µm	18901-100	100 g
	50 - 100µm	15926-100	100 g
	105 - 150µm	15927-100	100 g
	150 - 210µm	05483-250	250 g
	210 - 250µm	18902-100	100 g
	250 - 300µm	18903-100	100 g
	355 - 420µm	18905-100	100 g
	420 - 500µm	18906-100	100 g
	500 - 850µm	17596-250	250 g
Glass Beads, Hollow *A2g* . . . . . . Our hollow glass beads offer the strength and stability of glass at 1.1 g/cc nominal density. **Size Range**: 2 - 20µm Technical Data Sheet #744		19823-5	5 g

Glass Beads, Functionalized *H3g*
These are high surface area soda lime glass beads that have been functionalized by reaction with the appropriate organosilane. Prior to organosilane treatment, the surfaces of the glass particles are etched to increase the surface area. They are capable of coupling with peptides, dyes and other compounds, the amine-functional beads as supplied and the glycidyl-functional beads after periodate oxidation. Additional sizes are available on a custom basis. Technical Data Sheet #758

	Size Range		
Amine	30 - 50µm	23584-10	10 g
Glycidyl	30 - 50µm	23585-10	10 g

Iron Oxide Particles

Iron Oxide Particles *A2g*
Technical Data Sheet #605 and #607

	Nom. Dia.		
Black	0.2µm	17526-1	1 g
	0.2µm	17526-5	5 g
Red	0.3 - 0.8µm	07674-1	1 g

General Catalog

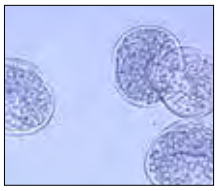
	Catalog #	Size
Spherical Ferromagnetic Iron Powder *H2bg* Technical Data Sheet #604		
Nom. Dia.		
2 - 3µm	19844-1	1 g
4 - 5µm	19829-1	1 g

Biologic Particles

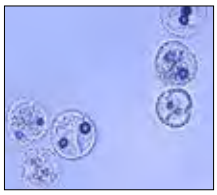
Corn Pollen *A2g* . . . . . 07664-1 1 g
Size Range: 85 - 90µm Technical Data Sheet #919

Paper Mulberry Pollen *A2g* . . . . . 07670-1 1 g
Size Range: 12 - 13µm Technical Data Sheet #919

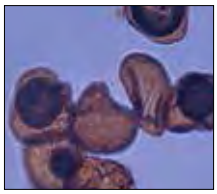
Pecan Pollen *A2g* . . . . . 07671-1 1 g
Size Range: 45 - 52µm Technical Data Sheet #919



Ragweed Pollen *A4g* . . . . . 07673-1 1 g
Size Range: 19 - 20µm Technical Data Sheet #919



Sporopollenin Lycopodium *A4g* . . . . . 16867-1 1 g
Nom. Dia.: 28µm Technical Data Sheet #281



Magnetic Bioseparations

Magnetic microparticles offer a highly convenient means to conduct a variety of bioseparations. Particles may be coated with antibodies, lectins or oligonucleotides to effect separations of specific cell populations or target sequences, and kits and protocols are also available for nonspecific or total isolations. We offer a broad range of magnetic particle-based kits and specific coatings for the enrichment of leukocyte populations, depletion of abundant proteins from serum, and isolation of glycoproteins and nucleic acids. And if you don't see an ideal product for your work, we welcome your call to discuss custom solutions.

Cell Separations

BioMag® SelectaPure anti-Leukocyte for Human or Mouse

BioMag® SelectaPure anti-Leukocyte for Human 418

BioMag® SelectaPure anti-Leukocyte for Mouse 418

BioMag® Negative Selection Cell Sorting Enrichment Systems 418

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BioMag®Plus Secondary Antibody Particles & Kits . . 419

BioMag®Plus Mouse anti-Fluorescein IgG 419

BioMag® Antibody Binding Proteins 419

BioMag® Proteins A & G 419

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Glycan / Glycoprotein Capture

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SNARe™ DNA Purification Systems

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SNARe™ Plasmid DNA Purification System 422

SNARe™ Whole Blood Genomic DNA Purification System . .422

Please see pages 410 - 411 for our complete selection of Magnetic Separators.

Magnetic Bioseparations

Cell Separation

BioMag® SelectaPure anti-Leukocyte for Human or Mouse

BioMag® SelectaPure anti-Human Leukocyte Particles *A2dm*
Requires Cold Pack.
BioMag® SelectaPure anti-Human CD IgG-coated particles are produced by covalently attaching murine monoclonal antibodies to BioMag® particles. The antibodies were prepared against human leukocyte differentiation antigens. Each product is supplied in phosphate buffered saline with EDTA and sodium azide added as stabilizers and should be washed in sterile media prior to use to remove the preservative.

	Concentration	Cellular Distribution	Catalog #	Size
SelectaPure anti-Human CD2	~4 mg/ml	Thymocytes, T cells	85002-5	5 ml
SelectaPure anti-Human CD3	~4 mg/ml	Pan T Mature	85003-5	5 ml
SelectaPure anti-Human CD4	~1.5 mg/ml	T Helper	85004-5	5 ml
SelectaPure anti-Human CD8	~1.5 mg/ml	Suppressor Cytotoxic T cells	85008-5	5 ml
SelectaPure anti-Human CD11b	~1 mg/ml	Activated Lymphocytes, Monocytes	85011-5	5 ml
SelectaPure anti-Human CD14	~1.5 mg/ml	Monocytes	85014-5	5 ml
SelectaPure anti-Human CD16	~4 mg/ml	NK cells	85016-5	5 ml
SelectaPure anti-Human CD19	~4 mg/ml	B Progenitors	85019-5	5 ml
SelectaPure anti-Human CD34	~4 mg/ml	Myeloid cells	85034-5	5 ml
SelectaPure anti-Human CD45	~4 mg/ml	Common Leukocyte cells	85045-5	5 ml
SelectaPure anti-Human CD56	~4 mg/ml	NK cells, Neuroectodermal cells	85056-5	5 ml
SelectaPure anti-Human CD71	~4 mg/ml	Proliferating Neoplastic cells	85071-5	5 ml

BioMag® SelectaPure anti-Mouse Leukocyte Particles *A2dm*
Requires Cold Pack.
BioMag® SelectaPure anti-Mouse particles are available for the isolation of CD4+, CD8a+ and CD45R murine lymphocytes.

	Concentration	Cellular Distribution		
anti-Mouse CD4	~1 mg/ml	T Helper	85104-5	5 ml
anti-Mouse CD8a	~1 mg/ml	Suppressor Cytotoxic T cells	85108-5	5 ml
anti-Mouse CD45R	~1 mg/ml	Restricted Leukocyte cells	85145-5	5 ml

BioMag® Negative Selection Cell Sorting Enrichment Systems

BioMag® Negative Selection Cell Sorting Enrichment Systems *A2dm*
Requires Cold Pack.
BioMag® Human T cell Enrichment Systems are available for the enrichment of CD3+, CD4+, or CD8+ T cell fractions from human peripheral blood mononuclear cells. Our enrichment systems involve the magnetic removal of subpopulations positive for other CD markers, leaving the untouched CD3+, CD4+ or CD8+ fraction available for analysis.

	Concentration			
CD3+ T cell Enrichment System	~1 mg/ml		85073-1	1 ml
	~1 mg/ml		85073-5	5 ml
CD4+ T cell Enrichment System	~1 mg/ml		85074-1	1 ml
	~1 mg/ml		85074-5	5 ml
CD8+ T cell Enrichment System	~1 mg/ml		85078-1	1 ml
	~1 mg/ml		85078-5	5 ml

Magnetic Bioseparations

BioMag® Secondary Antibody Particles

BioMag® Secondary Antibody Particles *A2dmw*
Requires Cold Pack.

	Concentration	Binding Capacity	Catalog #	Size
Goat anti-Human IgG	1 mg/ml	>0.10 mg/ml	84320-50	50 ml
Goat anti-Human IgG (Fc Specific)	5 mg/ml	>0.20 mg/ml	84324-50	50 ml
Goat anti-Human IgM	1 mg/ml	>0.15 mg/ml	84325-50	50 ml
Goat anti-Mouse IgG	1 mg/ml	>0.20 mg/ml	84340-50	50 ml
	1 mg/ml	>0.20 mg/ml	84340-500	500 ml
Goat anti-Mouse IgG (Fc Specific)	5 mg/ml	>0.15 mg/ml	84344-50	50 ml
	5 mg/ml	>0.15 mg/ml	84344-500	500 ml
Goat anti-Mouse IgM	1 mg/ml	>0.20 mg/ml	84350-50	50 ml
	1 mg/ml	>0.20 mg/ml	84350-500	500 ml
Goat anti-Rabbit IgG	1 mg/ml	>0.20 mg/ml	84300-50	50 ml
	1 mg/ml	>0.20 mg/ml	84300-500	500 ml
Goat anti-Rat IgG	1 mg/ml	>0.15 mg/ml	84330-50	50 ml
	1 mg/ml	>0.15 mg/ml	84330-500	500 ml
Goat anti-Rat IgG (Fc Specific)	5 mg/ml	>0.20 mg/ml	84334-50	50 ml
	5 mg/ml	>0.20 mg/ml	84334-500	500 ml
Goat anti-Rat IgM	5 mg/ml	>0.10 mg/ml	84335-50	50 ml
	5 mg/ml	>0.10 mg/ml	84335-500	500 ml

BioMag® Secondary Antibody Particles & Kits

BioMag®Plus Goat anti-Mouse IgG Secondary Antibody Particles *A2dmw* . . . . . 86021-50 50 ml
Requires Cold Pack.
Concentration: 1 mg/ml **Binding Capacity**: >0.20 mg/ml Technical Data Sheet #619

BioMag®Plus Goat anti-Mouse IgG Particle Antibody Coupling Starter Kit *A2dmw* . . 86020-1 1 kit
Requires Cold Pack.
This kit includes all of the reagents for the attachment of antibodies to BioMag®Plus superparamagnetic particles. Contents of the kit are sufficient for five binding reactions.
Kit Contains: 25ml BioMag®Plus anti-Mouse IgG *(Cat. #86021)*, 250ml Coupling / Wash Buffer, 5 x 15ml conical centrifuge tubes and BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)*.
Technical Data Sheet #619

BioMag®Plus Mouse anti-Fluorescein IgG *A2dm* . . . . . 86053-50 50 ml
Requires Cold Pack.
BioMag®Plus Mouse anti-Fluorescein IgG particles are a suspension of superparamagnetic particles covalently coupled to Mouse anti-Fluorescein IgG antibodies. They are supplied at 1 mg/ml in Phosphate Buffered Saline (pH 7.4) with EDTA and sodium azide added as stabilizers and are used for the magnetic separation of fluoresceinated cells, components or complexes from solution.
Technical Data Sheet #692

BioMag® Antibody Binding Proteins

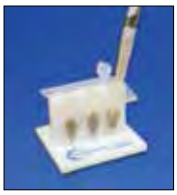
BioMag® Proteins A & G *A2dmw*
Requires Cold Pack.

	Concentration	Catalog #	Size
Protein A	5 mg/ml	84600-2	2 ml
	5 mg/ml	84600-10	10 ml
Protein G	5 mg/ml	84605-2	2 ml
	5 mg/ml	84605-10	10 ml

Magnetic Bioseparations

	Catalog #	Size
BioMag®Plus Protein A *A2dm* BioMag®Plus Protein A Particles are superparamagnetic particles approximately 1µm in size with Protein A covalently attached. Isolation of immunoglobulins using BioMag®Plus Protein A Particles allows isolation from small samples (50 microliters or less), as well as the option to easily scale up to larger samples. Technical Data Sheet #620	86041-2 86041-10	2 ml 10 ml
BioMag®Plus Protein G *A2dm* BioMag®Plus Protein G Particles are superparamagnetic particles approximately 1µm in size that have Protein G covalently attached. Isolation of immunoglobulins using BioMag®Plus Protein G particles allows isolation from small samples (50 microliters or less), as well as the option to easily scale up to larger samples. Technical Data Sheet #620	86051-2 86051-10	2 ml 10 ml
BioMag®Plus Protein A Antibody Isolation Starter Kit *A2dm* The kit contains all the reagents necessary for the isolation of antibodies from serum and cell culture supernatants. Contents of the kit are sufficient for five binding reactions. **Kit Contains**: 2.5ml BioMag®Plus Protein A *(Cat. #86041)*, 10 x 1.5ml microcentrifuge tubes, 50ml Protein A Binding / Wash Buffer, BioMag® SoloSep Microcentrifuge Tube Separator *(Cat. #8MB4112S-1)*, 5ml Protein A Elution Buffer and 1ml Protein A Neutralization Buffer. Technical Data Sheet #620	86040-1	1 kit
BioMag®Plus Protein G Antibody Isolation Starter Kit *A2dm* The kit contains all the reagents necessary for the isolation of antibodies from serum and cell culture supernatants. Contents of the kit are sufficient for five binding reactions. **Kit Contains**: 2.5ml BioMag®Plus Protein G *(Cat. #86051)*, 10 x 1.5ml microcentrifuge tubes, 50ml Protein G Binding / Wash Buffer, BioMag® SoloSep Microcentrifuge Tube Separator *(Cat. #8MB4112S-1)*, 5ml Protein G Elution Buffer and 1ml Protein G Neutralization Buffer. Technical Data Sheet #620	86050-1	1 kit

Protein Removal

BioMag® ProMax Albumin Removal Kit *A2dm* Based on patented BioMag® superparamagnetic particle technology, the ProMax Albumin Removal Kit depletes albumin from human serum samples in 30 minutes or less. ProMax Albumin Removal particles, along with optimized buffers, allow the binding and release of the less abundant proteins in serum while minimizing the binding of albumin, so that it may be washed away. The kit is supplied with all components needed for carrying out 25 procedures. Technical Data Sheet #658	24351-1	1 kit
BioMag® ProMax Serum IgG Removal Kit *A2dm* Reveal biomarkers in four easy steps. Based on patented BioMag® superparamagnetic particle technology, the ProMax Serum IgG Removal Kit selectively removes IgG from human serum samples in less than 30 minutes. The kit contains enough ProMax IgG Removal particles and optimized buffers for 10 reactions. Remove serum albumin from your IgG depleted samples with the ProMax Albumin Removal Kit. Technical Data Sheet #659 	24352-1	1 kit

Glycan / Glycoprotein Capture

BioMag®Plus Concanavalin A *A2dmw* Requires Cold Pack. BioMag®Plus Concanavalin A (Con A) coated microparticles provide a convenient means for isolating mannosyl and glucosyl-containing glycoproteins and polysaccharides from serum or cell lysate, or for investigating other lectin / glycan-mediated processes. The BioMag®Plus magnetic particle format provides high surface area and permits easy and efficient separations. Technical Data Sheet #766	86057-3 86057-10	3 ml 10 ml

Magnetic Bioseparations

	Catalog #	Size
BioMag®Plus Wheat Germ Agglutinin *A2dmw*	86054-3	3 ml
	86054-10	10 ml

Requires Cold Pack.
The unique saccharide-binding properties of plant lectins, such as wheat germ agglutinin (WGA), have made them useful for the study of glycosylated proteins. Lectins have been used in cell adhesion studies, to effect lymphocyte activation, and to explore carbohydrate-based therapeutics.

Our WGA-coated BioMag®Plus microparticles provide a convenient means for isolating N-acetylglucosamine-containing glycoproteins from cell lysate or to explore other lectin / glycan-mediated processes. The BioMag®Plus magnetic particle format provides high surface area, and permits easy and efficient separations. Technical Data Sheet #759

Nucleic Acid Isolation

BioMag® Streptavidin

BioMag® Streptavidin *A2dmw*
Requires Cold Pack.

Concentration		
5 mg/ml	84660-5	5 ml
5 mg/ml	84660-50	50 ml

BioMag®Plus Streptavidin *A2dmw*	86031-10	10 ml

Requires Cold Pack.
BioMag®Plus Streptavidin Particles are a suspension of superparamagnetic particles approximately 1µm in size, covalently attached to streptavidin. BioMag®Plus Streptavidin allows for capture of biotinylated oligonucleotides, proteins, dNTPs and other molecules. Provided as a suspension at ~5mg per ml. Technical Data Sheet #621

BioMag®Plus Streptavidin / Biotin Binding Starter Kit *A2dmw*	86030-1	1 kit

Requires Cold Pack.
This kit contains all reagents needed for the attachment of biotinylated proteins to BioMag®Plus superparamagnetic particles. Contents of kit are sufficient for 5 coupling reactions.

Kit Contains: 5ml of BioMag®Plus Streptavidin *(Cat. #86031)*, 250ml Coupling / Wash Buffer, BioMag® MultiSep Magnetic Separator *(Cat. #85200-1)* and 5 x 15ml conical centrifuge tubes. Technical Data Sheet #621

BioMag® Streptavidin, Nuclease-Free *A2dmw*	8MB4804-10	10 ml
	8MB4804-25	25 ml
	8MB4804-1	100 ml

Requires Cold Pack.
BioMag® Streptavidin, Nuclease-Free is a suspension of BioMag® Streptavidin particles for immobilizing biotinylated nucliec acids.

BioMag® mRNA Purification System

BioMag® SelectaPure mRNA Purification System *A2dm*	8MB4003K-1	1 kit

Requires Cold Pack.
The BioMag® SelectaPure mRNA Purification Kit is ideal for isolating mRNA from total RNA or tissue in 15 - 45 minutes depending upon sample.

Magnetic Bioseparations

	Catalog #	Size
BioMag® Oligo (dT)20 Particles *A2dm*	8MB4803-2	2 ml

Requires Cold Pack.
Nuclease-free BioMag® Oligo (dT)20 particles purify mRNA from total RNA, tissue and cells in 15 - 45 minutes depending upon sample.

Nucleic Acid Isolation

SNARe™ DNA Purification Systems

SNARe™ Plant Genomic DNA Purification System *H2dm*	85082-1	1 kit

The SNARe™ Plant Genomic DNA Purification System offers a rapid, cost-effective method for isolating DNA. The procedure does not require the use of organic solvents and is adaptable to different plant species. DNA Separation Particles supplied in the system are a suspension of superparamagnetic particles that bind double-stranded DNA. Once bound, the DNA-particle complex is stable. Impurities or unwanted proteins can be washed from the sample. DNA is then eluted from the DNA-particle complex, leaving a clean DNA preparation. Material for 100 isolations. Technical Data Sheet #712

SNARe™ Plasmid DNA Purification System *H2dm*	85081-1	1 kit

The SNARe™ Plasmid DNA Purification System offers a rapid, cost-effective method for isolating DNA. DNA Separation Particles supplied in the system are a suspension of superparamagnetic particles that bind double-stranded DNA. Once bound, the DNA-particle complex is stable. Impurities or unwanted proteins can be washed from the sample. The DNA is then eluted from the DNA particle complex, leaving a clean DNA preparation. Material for 100 isolations. Technical Data Sheet #711

SNARe™ Whole Blood Genomic DNA Purification System *H2dm*	85080-1	1 kit

The SNARe™ Whole Blood Genomic DNA Purification System offers a rapid, cost-effective method for isolating DNA. DNA Separation Particles supplied in the system are a suspension of superparamagnetic particles that bind double-stranded DNA. Once bound, the DNA-particle complex is stable. Impurities or unwanted proteins can be washed from the sample. DNA is then eluted from the DNA-particle complex, leaving a clean DNA preparation. Material for 100 isolations. Technical Data Sheet #710 and #710A

Please see pages 410 - 411 for our complete selection of Magnetic Separators.

Instrument Standards

Polysciences manufactures a comprehensive range of standards for analytical instruments such as cell analyzers, particle sizers, flow cytometers and fluorescence microscopes. Our catalog includes NIST Traceable Particle Size Standards, SureCount™ Particle Count Standards, ViaCheck™ Cell Viability and Concentration Controls, and a broad range of fluorescent and antibody capture beads for flow cytometric and imaging applications. Our newest addition, the StarLight™ Calibration Slide Collection, presents an additional tool for fluorescence microscopy.

If a product that you need is not listed in the following pages, please check our website (www.polysciences.com) as our product line is continually expanding. We also invite you to contact us regarding our custom synthesis and contract manufacturing services.

NIST Traceable Size Standards

Nanobead NIST Traceable Particle Size Standards 424
Microbead NIST Traceable Particle Size Standards 425
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Count Standards

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Fluorescence Intensity Standards 426
StarLight™ Calibration Slides 427

Cell Viability Standards

ViaCheck™ Viability Controls 427
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- Quantum™ QC 428
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Cell Counting
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Instrument Standards

NIST Traceable Size Standards

Precision Size Standards are offered in three size groupings: Nanobead, Microbead and Megabead. They are measured on in-house instruments calibrated with NIST Standard Reference Materials. Each product is supplied with a Certificate of Traceability. The size, standard deviation, coefficient of variation and lot number are printed on the label for easy reference.

Nanobead NIST Traceable Particle Size Standards *A2dm*
Nanobead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 40nm to 950nm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range	Catalog #	Size
40nm	36 - 44nm	64004-15	15 ml
50nm	45 - 55nm	64005-15	15 ml
60nm	54 - 66nm	64006-15	15 ml
70nm	65 - 74nm	64007-15	15 ml
80nm	75 - 84nm	64008-15	15 ml
90nm	85 - 94nm	64009-15	15 ml
100nm	95 - 110nm	64010-15	15 ml
125nm	120 - 130nm	64011-15	15 ml
150nm	140 - 160nm	64012-15	15 ml
200nm	190 - 210nm	64013-15	15 ml
250nm	240 - 260nm	64014-15	15 ml
300nm	285 - 315nm	64015-15	15 ml
350nm	335 - 365nm	64016-15	15 ml
400nm	380 - 420nm	64017-15	15 ml
450nm	430 - 470nm	64018-15	15 ml
500nm	480 - 520nm	64019-15	15 ml
550nm	530 - 570nm	64020-15	15 ml
600nm	580 - 620nm	64021-15	15 ml
650nm	630 - 670nm	64022-15	15 ml
700nm	680 - 720nm	64023-15	15 ml
750nm	730 - 770nm	64024-15	15 ml
800nm	780 - 820nm	64025-15	15 ml
850nm	830 - 870nm	64026-15	15 ml
900nm	880 - 920nm	64027-15	15 ml
950nm	930 - 970nm	64028-15	15 ml

Instrument Standards

Microbead NIST Traceable Particle Size Standards *A2dm*

Microbead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 1.0µm to 9.0µm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range	Catalog #	Size
1.00µm	0.95 - 1.05µm	64030-15	15 ml
1.25µm	1.20 - 1.30µm	64035-15	15 ml
1.50µm	1.45 - 1.55µm	64040-15	15 ml
1.75µm	1.70 - 1.80µm	64045-15	15 ml
2.00µm	1.90 - 2.10µm	64050-15	15 ml
2.50µm	2.40 - 2.60µm	64055-15	15 ml
3.00µm	2.85 - 3.15µm	64060-15	15 ml
3.50µm	3.30 - 3.70µm	64065-15	15 ml
4.00µm	3.80 - 4.20µm	64070-15	15 ml
5.00µm	4.70 - 5.30µm	64080-15	15 ml
6.00µm	5.70 - 6.30µm	64090-15	15 ml
7.00µm	6.60 - 7.40µm	64100-15	15 ml
8.00µm	7.60 - 8.40µm	64110-15	15 ml
9.00µm	8.10 - 9.90µm	64120-15	15 ml

Megabead NIST Traceable Particle Size Standards *A2dm*

Megabead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 10.0µm to 175.0µm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range		
10.0µm	9.50 - 10.50µm	64130-15	15 ml
12.0µm	11.50 - 12.50µm	64140-15	15 ml
15.0µm	14.00 - 16.00µm	64155-15	15 ml
20.0µm	19.00 - 21.00µm	64160-15	15 ml
25.0µm	24.00 - 26.00µm	64165-15	15 ml
30.0µm	28.00 - 32.00µm	64170-15	15 ml
40.0µm	36.00 - 44.00µm	64180-15	15 ml
50.0µm	48.00 - 52.00µm	64190-15	15 ml
60.0µm	57.00 - 63.00µm	64200-15	15 ml
80.0µm	75.00 - 85.00µm	64210-15	15 ml
100.0µm	90.00 - 110.00µm	64220-15	15 ml
125.0µm	115.00 - 135.00µm	64225-15	15 ml
150.0µm	140.00 - 160.00µm	64230-15	15 ml
175.0µm	165.00 - 185.00µm	64235-15	15 ml

For cell size estimation, see our Flow Cytometry products on page 428.

Instrument Standards

Count Standards

SureCount™ Particle Count Standards *A3dmw*

SureCount™ Particle Count Standards are suspensions of polymer microspheres intended for the validation and monitoring of particle counters and supporting sample preparation processes. SureCount™ standards are available in diameters of 3µm, 5µm, 10µm and 15µm. Diameters are traceable to NIST Standard Reference Materials. The standards are supplied as ~1x10^6 microspheres/ml aqueous suspensions in 10ml volumes and each bottle is provided with a Certificate of Traceability. Technical Data Sheet #852

Nom. Dia.	Catalog #	Size
3µm	25379-10	10 ml
5µm	25380-10	10 ml
10µm	25381-10	10 ml
15µm	25382-10	10 ml

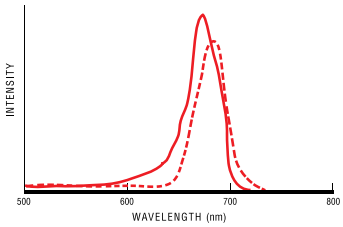
See our Flow Cytometry Absolute Count Standard™ on page 440.

Fluorescence Standards

Fluorescence Intensity Standards

Flash Red Intensity Standard *A2dm* . . . . . BLIFR06M-1 1 kit

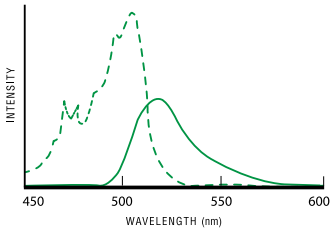
The Flash Red Intensity Standard kit consists of five populations of ~8µm microspheres dyed with increasing amounts of our Flash Red fluorophore. The different intensity populations may serve as relative intensity standards for fluorescence-based applications in microscopy or flow cytometry, and as internally-dyed beads, they will stand up to the rigors of imaging. As Flash Red is spectrally similar to Cy™5, traditional red fluorophore filter sets (e.g. Cy™5 / microscope; PE-Cy™5 or APC / cytometer) may be used with the standard. The beads may also serve as very bright relative intensity or linearity standards for flow cytometry; ask about the Bangs Laboratories, Inc. QuickCal® Linearity Template if this is your interest. Technical Data Sheet #PDS 704



Flash Red (660, 690)

Dragon Green Intensity Standard *A2dm* . . . . . BLIDG06M-1 1 kit

This kit consists of five populations of ~8µm microspheres dyed with increasing amounts of our Dragon Green fluorophore. The different intensity populations may serve as relative intensity standards in fluorescent microscopy and, as internally-dyed beads, they will stand up to the rigors of imaging. Dragon Green is an excellent spectral surrogate for fluorescein and is suitable for use with fluorescein filter sets. The beads may also serve as very bright relative intensity or linearity standards for flow cytometry; ask about the Bangs Laboratories QuickCal® Linearity Template if this is your interest. Technical Data Sheet #PDS 704

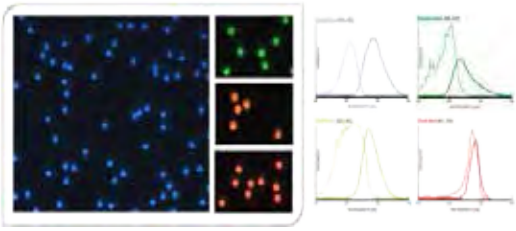


Dragon Green (480, 520)

Instrument Standards

	Catalog #	Size
StarLight™ Collection, Slide 4-Pack *abg*	25445-1	4 slides

Our StarLight™ Collection includes one of each of our StarLight™ Calibration slides, which feature vibrant ~6µm fluorescent microspheres dyed with a single fluorophore for basic imaging checks and calibration. The four slides are appropriate for use with common microscope filter sets:



- **Glacial Blue** (360, 450)
- **Dragon Green** (480, 520)
- **Envy Green** (525, 565)
- **Flash Red** (660, 690)

Technical Data Sheet #913

StarLight™ Calibration Individual Slides *abg*

Our new StarLight™ Calibration Slides feature vibrant ~6µm fluorescent microspheres dyed with your choice of fluorophore below for basic imaging checks and calibration.

Glacial Blue	25442-1	1 slide
Envy Green	25443-1	1 slide
Flash Red	25444-1	1 slide
Dragon Green	25441-1	1 slide

For additional fluorescence products, see our Fluoresbrite® microspheres on pages 393 - 397 and our Flow Cytometry products starting on page 428.

Cell Viability

ViaCheck™ Viability and Concentration Standards

ViaCheck™ Viability and Concentration Standards are part of our extensive line of microsphere standards for instrument QC. ViaCheck™ standards mimic the light scattering characteristics of "live" and "dead" cells in the trypan blue dye exclusion method, and may be used to confirm the capabilities and verify the performance of image-based cell viability instruments. The standards are available in a range of common concentrations and live/dead ratios. Technical Data Sheets #729 & 736

ViaCheck™ Cell Viability & Concentration Controls

Technical Data Sheet #729

	Viable %	Concentration (ml)		
Cell Viability Controls	0	1×10^6	24622-20	20 ml
	25	1×10^6	25997-20	20 ml
	50	1×10^6	24623-20	20 ml
	75	1×10^6	24624-20	20 ml
	90	1×10^6	24625-20	20 ml
	100	1×10^6	24626-20	20 ml
Concentration Controls		1×10^6	24627-20	20 ml

Instrument Standards

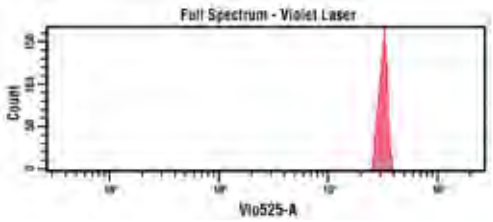
Viable %	Concentration (ml)	Catalog #	Size
	4×10^6	24628-20	20 ml
	8×10^6	24629-20	20 ml

Flow Cytometry Standards

Routine Quality Control

Full Spectrum™ *adm*

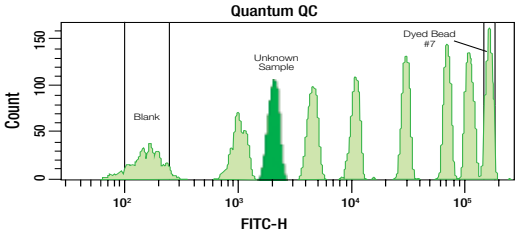
Multi-color Reference Standards are highly uniform microspheres which fluoresce over a broad range of the spectrum to provide several reference positions in multi-detector analysis. Used to properly align flow cytometers excited from UV to near IR, this standard emits over the entire spectrum. Technical Data Sheet #PDS 885



Tests	Catalog #	Size
20	BLI885A-1	1 ml
100	BLI885B-5	5 ml
280	BLI885C-14	14 ml

New! Quantum™ QC . . . . . BLI725-5 5 ml

Quantum™ QC is a multi-intensity, multi-fluorescent standard that is intended for use as an in-depth tool for daily cytometer QC, and is appropriate for use with all lasers and detectors. It may be used to determine detection thresholds, understand resolution, and assess and track linearity of detectors. It can aid in providing confidence that the system is suitable for use, or alert operators to potential problems before samples are run. Quantum™ QC may also be used for instrument set-up to achieve standardized PMT settings and define the window of analysis for relevant detectors. Quantum™ QC is comprised of a blank and 7 (mixed) intensity populations. Quantum QC is used with a QuickCal-Linearity template that is downloaded from our website with an Access Code provided with the product at the time of shipping. Technical Data Sheet #PDS #725 & 725A



Ultra Rainbow Fluorescent Particles *adm*

Ultra Rainbow Fluorescent Particles are internally labeled with a mixture of fluorophores which enables them to be excited at wavelengths from 365nm to 650nm. Technical Data Sheet #PDS 612

Nom. Dia.	Tests	Catalog #	Size
~3.8µm	20	BLI610A-1	1 ml
~3.8µm	100	BLI610B-5	5 ml
~3.8µm	280	BLI610C-14	14 ml
~10.2µm	20	BLI611A-1	1 ml
~10.2µm	100	BLI611B-5	5 ml
~10.2µm	280	BLI611C-14	14 ml

Fluorescence Reference Standards *adm*

Fluorescence Reference Standards are labeled with specific fluorochromes so that they give rise to the same fluorescence spectra as cells labeled with the same fluorochromes. Fluorescence intensity is similar to biological samples. Technical Data Sheets #PDS 890 and #PDS 892

	Tests	Catalog #	Size
Acridine Orange	20	BLI897A-1	1 ml
	100	BLI897B-5	5 ml
	280	BLI897C-14	14 ml

Instrument Standards

Fluorescence Reference Standards, cont.

	Tests	Catalog #	Size
Alexa Fluor® 488	20	BLI886A-1	1 ml
	100	BLI886B-5	5 ml
	280	BLI886C-14	14 ml
Alexa Fluor® 647	20	BLI887A-1	1 ml
	100	BLI887B-5	5 ml
	280	BLI887C-14	14 ml
Allophycocyanine (APC)	20	BLI901A-1	1 ml
	100	BLI901B-5	5 ml
	280	BLI901C-14	14 ml
APC-Cy™7	20	BLI914A-1	1 ml
	100	BLI914B-5	5 ml
	280	BLI914C-14	14 ml
Certified Blank™ (no label)	20	BLI890A-1	1 ml
	100	BLI890B-5	5 ml
	280	BLI890C-14	14 ml
Chlorophyll	20	BLI898A-1	1 ml
	100	BLI898B-5	5 ml
	280	BLI898C-14	14 ml
Cy™5	20	BLI895A-1	1 ml
	100	BLI895B-5	5 ml
	280	BLI895C-14	14 ml
DAPI	20	BLI906A-1	1 ml
	100	BLI906B-5	5 ml
	280	BLI906C-14	14 ml
Far Out Red	20	BLI913A-1	1 ml
	100	BLI913B-5	5 ml
	280	BLI913C-14	14 ml
Fluorescein	20	BLI891A-1	1 ml
	100	BLI891B-5	5 ml
	280	BLI891C-14	14 ml
Hoechst 33342	20	BLI894A-1	1 ml
	100	BLI894B-5	5 ml
	280	BLI894C-14	14 ml
Pacific Blue™	20	BLI916A-1	1 ml
	100	BLI916B-5	5 ml
	280	BLI916C-14	14 ml
PE-Cy™5	20	BLI908A-1	1 ml
	100	BLI908B-5	5 ml
	280	BLI908C-14	14 ml
PE-Cy™7	20	BLI889A-1	1 ml
	100	BLI889B-5	5 ml
	280	BLI889C-14	14 ml

Instrument Standards

Fluorescence Reference Standards, cont.

	Tests	Catalog #	Size
PE-TR	20	BLI909A-1	1 ml
	100	BLI909B-5	5 ml
	280	BLI909C-14	14 ml
Propidium Iodide	20	BLI892A-1	1 ml
	100	BLI892B-5	5 ml
	280	BLI892C-14	14 ml
R-Phycoerythrin	20	BLI899A-1	1 ml
	100	BLI899B-5	5 ml
	280	BLI899C-14	14 ml
T.M. Rhodamine	20	BLI905A-1	1 ml
	100	BLI905B-5	5 ml
	280	BLI905C-14	14 ml
Texas Red®	20	BLI893A-1	1 ml
	100	BLI893B-5	5 ml
	280	BLI893C-14	14 ml
Violet Laser	20	BLI915A-1	1 ml
	100	BLI915B-5	5 ml
	280	BLI915C-14	14 ml

Fluoresbrite® Yellow Green (YG) Microspheres, Calibration Grade *A2dmw*

This special grade of Fluoresbrite® Yellow Green (YG) Microspheres has been evaluated both for particle diameter and the uniformity of the fluorescent dye distribution. Instrument manufacturers have demanded these high quality particles for their flow cytometry standards.

Nom. Dia.		
0.50µm	18859-1	1 ml
1.00µm	18860-1	1 ml
2.00µm	18604-1	1 ml
3.00µm	18861-1	1 ml
6.00µm	18862-1	1 ml

Fluoresbrite® Calibration Grade Size Range Kit *A2dmw* . . . . . 18132-1 1 kit

Our unique synthesis methods routinely result in particles with fluorescence CV's less than 5% and often as low as 1%. This kit guarantees that our discriminating customer will have the finest particles with the lowest fluorescence CV currently available from our stock. A range of 5 sizes of Fluoresbrite® YG microspheres can be used to calibrate the green channel.

Kit Contains: 1ml at 2.5% solids for each nominal size: 0.5µm, 1.0µm, 2.0µm, 3.0µm and 6.0µm.

Time Delay Calibration Standard *ad*

Our Time Delay Calibration Standard is intended for use in assessing the delay between blue and red lasers. It features ~6µm microspheres dyed with a fluorophore that is excited with 488nm or 635nm excitation, and exhibits red / far-red emission. Technical Data Sheet #PDS 831

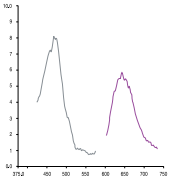
Tests		
20	BLI830A-1	1 ml
100	BLI830B-5	5 ml
280	BLI830C-14	14 ml

Instrument Standards

	Catalog #	Size
Flow Check™ Ruby Red Fluorescent Microspheres *A2dm*	24288-5	5 ml

Flow Check™ Ruby Red Fluorescent Microspheres are ~6µm narrow distribution polystyrene particles that can be used for flow cytometry applications where fluorescence emission in the range of 600nm to 710nm is needed. Suitable for 488nm and 663nm excitation with detection in PE-Cy™5 or APC channels. Supplied as a 5ml suspension (~5 x 10^6 beads/ml) in a convenient dropper bottle. Ex. max: 475nm; Em. max: 663nm. Technical Data Sheet #624

Excitation and Emission Spectra of Flow Check® Ruby Red Reference Microspheres in Water



Absorption spans approximately 380nm to 520nm. Emission was recorded at 488nm excitation.

Alignment

Right Reference Standard™ *adm*

Each Right Reference Standard™ consists of a single population of particles labeled with a single fluorochrome at a given reference intensity range (Low, Medium or High) which will provide a unified fluorescence range for a particular fluorescence channel. A test requires one drop (50µl) of particle suspension, which is equivalent to ~100,000 particles. Bangs Flow Cytometry Standards are 7 - 9µm in diameter (unless otherwise noted) to approximate the size of human lymphocytes. Technical Data Sheet #PDS 510

	Tests		
APC High	100	BLI521-5	5 ml
Fluorescein High	100	BLI512-5	5 ml
PE-Cy™5 High	100	BLI518-5	5 ml
Phycoerythrin High	100	BLI515-5	5 ml

Flow Check™ Yellow Green (YG) Size Range Calibration Kit	23514-1	1 kit

The Flow Check™ YG Size Range Calibration Kit contains suspensions of four high intensity microparticles, which have been tested under flow cytometry conditions for uniformity of size and fluorescent signal. The kit contains 10ml of each of the following nominal particle sizes: 0.5µm, 1.0µm, 2.0µm and 6.0µm (with particle concentrations as listed). The YG dye mimics the spectral properties of FITC without the leaching common to FITC. Technical Data Sheet #508

Flow Check™ High Intensity Alignment Grade Particles *A2dm*

Technical Data Sheet #508

	Nom. Dia.		
Bright Blue (BB)	0.50µm	23520-10	10 ml
Yellow Green (YG)	1.00µm	23517-10	10 ml
Yellow Green (YG)	2.00µm	23518-10	10 ml
Yellow Green (YG)	6.00µm	23519-10	10 ml

Instrument Standards

Linearity

Quantum™ MESF *adm*

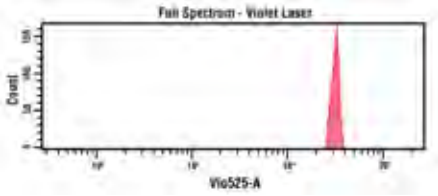
Quantum™ MESF Kits consist of a series of reference microbead standards whose intensities have been calibrated in Molecules of Equivalent Soluble Fluorochrome (MESF) units. Our FREE Flow Cytometry Data Analysis template, QuickCal®, works with all Quantum™ MESF Kits (access QuickCal® by visiting www.bangslabs.com/products/quickcal and entering the Access Number provided with your standards). A test requires one drop (50µl, ~100,000 particles) of each particle suspension. Bangs Flow Cytometry Standards are 7-9µm in diameter (unless otherwise noted) to approximate the size of human lymphocytes. Technical Data Sheet #PDS 821

	Tests	Catalog #	Size
Alexa Fluor® 488 MESF	20	BLI488A-1	1 ml
	100	BLI488B-5	5 ml
	280	BLI488C-14	14 ml
FITC-5 MESF	20	BLI555A-1	1 ml
	100	BLI555B-5	5 ml
	280	BLI555C-14	14 ml
FITC-5 MESF (Premix)	20	BLI555PA-1	1 ml
	100	BLI555PB-5	5 ml
	280	BLI555PC-14	14 ml
R-PE MESF	20	BLI827A-1	1 ml
	100	BLI827B-5	5 ml
	280	BLI827C-14	14 ml
PE-Cy™5 MESF	20	BLI828A-1	1 ml
Cy™5 MESF	20	BLI822A-1	1 ml
	100	BLI822B-5	5 ml
	280	BLI822C-14	14 ml
Alexa Fluor® 647 MESF	20	BLI647A-1	1 ml
	100	BLI647B-5	5 ml
	280	BLI647C-14	14 ml
APC MESF	20	BLI823A-1	1 ml
	100	BLI823B-5	5 ml
	280	BLI823C-14	14 ml

General Instrument Set-Up

Full Spectrum™ *adm*

Multi-color Reference Standards are highly uniform microspheres that fluoresce over a broad range of the spectrum to provide several reference positions in multi-detector analysis. Used to properly align flow cytometers excited from UV to near IR, this standard emits over the entire spectrum. Technical Data Sheet #PDS 885

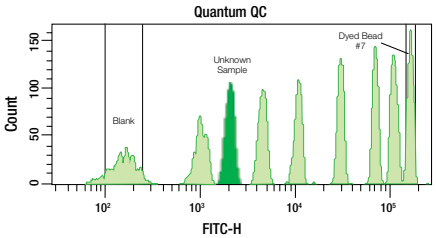


Tests	Catalog #	Size
20	BLI885A-1	1 ml
100	BLI885B-5	5 ml
280	BLI885C-14	14 ml

Instrument Standards

	Catalog #	Size
New! Quantum™ QC	BLI725-5	5 ml

Quantum™ QC is a multi-intensity, multi-fluorescent that is intended for use as an in-depth tool for daily cytometer QC, and is appropriate for use with all lasers and detectors. It may be used to determine detection thresholds, understand resolution, and assess and track linearity of detectors. It can aid in providing confidence that the system is suitable for use, or alert operators to potential problems before samples are run. Quantum™ QC may also be used for instrument set-up to achieve standardized PMT settings and define the window of analysis for relevant detectors. Quantum™ QC is comprised of a blank and 7 (mixed) intensity populations. Quantum QC is used with a QuickCal-Linearity template that is downloaded from our website with an Access Code provided with the product at the time of shipping. Technical Data Sheet #PDS #725 & 725A



Ultra Rainbow Fluorescent Particles *adm*

Ultra Rainbow Fluorescent Particles are internally labeled with a mixture of fluorophores that enables them to be excited at wavelengths from 365nm to 650nm. Technical Data Sheet #PDS 612

Nom. Dia.	Tests		
~3.8µm	20	BLI610A-1	1 ml
~3.8µm	100	BLI610B-5	5 ml
~3.8µm	280	BLI610C-14	14 ml
~10.2µm	20	BLI611A-1	1 ml
~10.2µm	100	BLI611B-5	5 ml
~10.2µm	280	BLI611C-14	14 ml

Compensation

FITC / PE Compensation Standard *adm*

The FITC / PE Compensation Standard is a convenient means of setting two color compensation on a flow cytometer. Each kit contains an Autofluor™ bead, as well as a bead labeled with FITC, a bead labeled with PE, and one labeled with both FITC and PE. Technical Data Sheet #PDS 820

Tests		
20	BLI820A-1	1 ml
100	BLI820B-5	5 ml
280	BLI820C-14	14 ml

Simply Cellular® Compensation Standards *adm*

The Simply Cellular® Compensation Standard is a mixture of two Simply Cellular® antibody coated particle populations capable of binding high and low levels of the monoclonal antibody used in your assay. Ideal for performing compensation in multicolor (2, 3, 4 or more) analysis. Kits are specific for mouse, rat or human monoclonal antibodies. Technical Data Sheets #PDS 850, #PDS 851 and #PDS 852

	Tests		
anti-Mouse IgG	100	BLI550-5	5 ml
anti-Human IgG	100	BLI552-5	5 ml
anti-Rat IgG	100	BLI551-5	5 ml

Instrument Standards

	Catalog #	Size

Simply Cellular® anti-Mouse for Violet Laser

The Simply Cellular® anti-Mouse for Violet Laser standard features microspheres comprised of a proprietary matrix that exhibits low autofluorescence with violet excitation. Beads are suitable for labeling with mouse antibodies conjugated with violet fluorochromes, and for use as a compensation or general reference standard for detectors off of the violet laser. Beads are also suitable for use with other fluorochromes / detectors, e.g. 488nm, 633nm. The Simply Cellular® anti-Mouse for Violet Laser standard is supplied as 2 populations: 1 blank and 1 high-binding anti-Mouse IgG (Fc specific) population. Supplied in an aqueous suspension containing ProClin®. Technical Data Sheet #PDS 835

Tests		
20	BLI835A-1	1 ml
100	BLI835B-5	5 ml

Flow Cytometry Protein A Antibody Binding Beads *adm*

Single population Protein A microspheres are suitable for labeling with conjugated antibodies from a range of hosts. Labeled microspheres may be used as single-population reference standards or in conjuction with an unlabeled population for compensation purposes. Technical Data Sheet #PDS 853

BLI553-1	1 ml
BLI553-5	5 ml
BLI553-14	14 ml

Flow Cytometry Protein G Antibody Binding Beads *adm*

Single population Protein G microspheres are suitable for labeling with conjugated antibodies from a range of hosts. Labeled microspheres may be used as single-population reference standards or in conjuction with an unlabeled population for compensation purposes. Technical Data Sheet #PDS 854

BLI554-1	1 ml
BLI554-5	5 ml
BLI554-14	14 ml

Viability Dye Compensation Standard *adm*

Viability Dye Compensation Standards are suitable for labeling with LIVE / DEAD® stains or similarily reactive dyes to generate compensation standards for flow cytometric analyses. Beads are not suitable for labeling with DNA stains such as propidium iodide, DAPI, or Sytox®, and users should contact Technical Service for discussion if uncertain as to the compatibility of a specific dye or stain. Technical Data Sheet #PDS 853

Nom. Dia.		
4µm	BLI450-3	3 ml
8µm	BLI451-3	3 ml

Fluorescence Reference

Flow Check™ YG Kit 2.0 *A2dm*

23513-1 — 1 kit

The particles in this kit allow comparison of various levels of green fluorescence. The kit contains 4 components packaged with ~$1x10^7$ particles/ml: a full intensity bead, two intermediate intensity beads and a blank bead. The CV's of these particles offer excellent size and fluorescent CV control of all our microspheres. Technical Data Sheet #508

Components

Flow Check™ Yellow Green (YG) 2.0 High Intensity Alignment Grade	23518-10	10 ml
Flow Check™ Yellow Green (YG) Low Intensity Level 1	23524-10	10 ml
Flow Check™ Yellow Green (YG) Low Intensity Level 2	23525-10	10 ml
Flow Check™ Yellow Green (YG) Unlabeled	23526-10	10 ml

Flow Check™ YG Kit 6.0 *A2dm*

23512-1 — 1 kit

The particles in this kit allow comparison of various levels of green fluorescence.
Kit Contains: 4 components, each packaged with ~2 x 10^6 particles/ml: a full intensity bead, two intermediate intensity beads and a blank bead. Technical Data Sheet #508

Components

Flow Check™ Yellow Green (YG) 6.0 High Intensity Alignment Grade	23519-10	10 ml
Flow Check™ Yellow Green (YG) Low Intensity Level 1	23522-10	10 ml
Flow Check™ Yellow Green (YG) Low Intensity Level 2	23523-10	10 ml
Flow Check™ Yellow Green (YG) Unlabeled	23521-10	10 ml

Instrument Standards

Fluorescence Reference Standards *adm*

Fluorescence Reference Standards are labeled with specific fluorochromes so that they give rise to the same fluorescence spectra as cells labeled with the same fluorochromes. Fluorescence intensity is similar to biological samples. Technical Data Sheets #PDS 890 and #PDS 892

	Tests	Catalog #	Size
Acridine Orange	20	BLI897A-1	1 ml
	100	BLI897B-5	5 ml
	280	BLI897C-14	14 ml
Alexa Fluor® 488	20	BLI886A-1	1 ml
	100	BLI886B-5	5 ml
	280	BLI886C-14	14 ml
Alexa Fluor® 647	20	BLI887A-1	1 ml
	100	BLI887B-5	5 ml
	280	BLI887C-14	14 ml
Allophycocyanine (APC)	20	BLI901A-1	1 ml
	100	BLI901B-5	5 ml
	280	BLI901C-14	14 ml
APC-Cy™7	20	BLI914A-1	1 ml
	100	BLI914B-5	5 ml
	280	BLI914C-14	14 ml
Certified Blank™ (no label)	20	BLI890A-1	1 ml
	100	BLI890B-5	5 ml
	280	BLI890C-14	14 ml
Chlorophyll	20	BLI898A-1	1 ml
	100	BLI898B-5	5 ml
	280	BLI898C-14	14 ml
Cy™5	20	BLI895A-1	1 ml
	100	BLI895B-5	5 ml
	280	BLI895C-14	14 ml
DAPI	20	BLI906A-1	1 ml
	100	BLI906B-5	5 ml
	280	BLI906C-14	14 ml
Far Out Red	20	BLI913A-1	1 ml
	100	BLI913B-5	5 ml
	280	BLI913C-14	14 ml
Fluorescein	20	BLI891A-1	1 ml
	100	BLI891B-5	5 ml
	280	BLI891C-14	14 ml
Hoechst 33342	20	BLI894A-1	1 ml
	100	BLI894B-5	5 ml
	280	BLI894C-14	14 ml
Pacific Blue™	20	BLI916A-1	1 ml
	100	BLI916B-5	5 ml
	280	BLI916C-14	14 ml
PE-Cy™5	20	BLI908A-1	1 ml
	100	BLI908B-5	5 ml

Instrument Standards

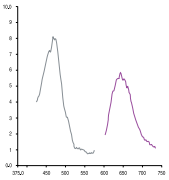
Fluorescence Reference Standards, cont.

	Tests	Catalog #	Size
	280	BLI908C-14	14 ml
PE-Cy™7	20	BLI889A-1	1 ml
	100	BLI889B-5	5 ml
	280	BLI889C-14	14 ml
PE-TR	20	BLI909A-1	1 ml
	100	BLI909B-5	5 ml
	280	BLI909C-14	14 ml
Propidium Iodide	20	BLI892A-1	1 ml
	100	BLI892B-5	5 ml
	280	BLI892C-14	14 ml
R-Phycoerythrin	20	BLI899A-1	1 ml
	100	BLI899B-5	5 ml
	280	BLI899C-14	14 ml
T.M. Rhodamine	20	BLI905A-1	1 ml
	100	BLI905B-5	5 ml
	280	BLI905C-14	14 ml
Texas Red®	20	BLI893A-1	1 ml
	100	BLI893B-5	5 ml
	280	BLI893C-14	14 ml
Violet Laser	20	BLI915A-1	1 ml
	100	BLI915B-5	5 ml
	280	BLI915C-14	14 ml

Flow Check™ Ruby Red Fluorescent Microspheres *A2dm* . . . . . 24288-5 5 ml

Flow Check™ Ruby Red Fluorescent Microspheres are ~6µm narrow distribution polystyrene particles that can be used for flow cytometry applications where fluorescence emission in the range of 600nm to 710nm is needed. Suitable for 488nm and 663nm excitation with detection in PE-Cy™5 or APC channels. Supplied as a 5ml suspension (~5 x 10^6 beads/ml) in a convenient dropper bottle. Ex. max: 475nm; Em. max: 663nm. Technical Data Sheet #624

Excitation and Emission Spectra of Flow Check® Ruby Red Reference Microspheres in Water



Excitation Spectra Max., 475nm

Emission Spectra Max., 663nm

Absorption spans approximately 380nm to 520nm. Emission was recorded at 488nm excitation.

Fluorescence Quantitation

Simply Cellular® *dm*

Antibody Binding Standards are particles that have ligands covalently linked to their surfaces to bind specific antibodies (e.g. Mouse IgG antibodies) in calibrated quantities. Technical Data Sheets #PDS 810, #PDS 812 and #PDS 813

	Tests	Catalog #	Size
anti-Mouse IgG	20	BLI810A-1	1 ml
	100	BLI810B-5	5 ml
	280	BLI810C-14	14 ml

Instrument Standards

	Tests	Catalog #	Size
anti-Human IgG	20	BLI812A-1	1 ml
	100	BLI812B-5	5 ml
	280	BLI812C-14	14 ml
anti-Rat IgG	20	BLI813A-1	1 ml
	100	BLI813B-5	5 ml
	280	BLI813C-14	14 ml

Simply Cellular® Compensation Standards *adm*

The Simply Cellular® Compensation Standard is a mixture of two Simply Cellular® antibody coated particle populations capable of binding high and low levels of the monoclonal antibody used in your assay. Ideal for performing compensation in multicolor (2, 3, 4 or more) analysis. Kits are specific for mouse, rat or human monoclonal antibodies. Technical Data Sheet #PDS 850, #PDS 851 and #PDS 852

	Tests		
anti-Mouse IgG	100	BLI550-5	5 ml
anti-Human IgG	100	BLI552-5	5 ml
anti-Rat IgG	100	BLI551-5	5 ml

Quantum™ Simply Cellular® *dm*

Quantum™ Simply Cellular® Kits contain a mixture of microbeads that bind specific amounts of IgG antibodies. These standards are calibrated in terms of Antibody Binding Capacity (ABC) and can be used to construct calibration plots to determine the ABC of unknown samples and monitor instrument performance. Our FREE Flow Cytometry Data Analysis, QuickCal® is designed to work with all Quantum™ Simply Cellular® Kits *(access QuickCal® by visiting www.bangslabs.com/products/quickcal and entering the Access Number provided with your standards).* Technical Data Sheet #PDS 814

	Tests		
anti-Mouse IgG	20	BLI815A-1	1 ml
	100	BLI815B-5	5 ml
	280	BLI815C-14	14 ml
anti-Human IgG	20	BLI816A-1	1 ml
	100	BLI816B-5	5 ml
	280	BLI816C-14	14 ml
anti-Rat IgG	20	BLI817A-1	1 ml
	100	BLI817B-5	5 ml
	280	BLI817C-14	14 ml

Instrument Standards

Quantum™ MESF *adm*

Quantum™ MESF Kits consist of a series of reference microbead standards whose intensities have been calibrated in Molecules of Equivalent Soluble Fluorochrome (MESF) units. Our FREE Flow Cytometry Data Analysis template, QuickCal®, works with all Quantum™ MESF Kits *(access QuickCal® by visiting www.bangslabs.com/products/quickcal and entering the Access Number provided with your standards)*. A test requires one drop (50µl, ~100,000 particles) of each particle suspension. Bangs Flow Cytometry Standards are 7 - 9µm in diameter (unless otherwise noted) to approximate the size of human lymphocytes. Technical Data Sheet #PDS 821

	Tests	Catalog #	Size
Alexa Fluor® 488 MESF	20	BLI488A-1	1 ml
	100	BLI488B-5	5 ml
	280	BLI488C-14	14 ml
FITC-5 MESF	20	BLI555A-1	1 ml
	100	BLI555B-5	5 ml
	280	BLI555C-14	14 ml
FITC-5 MESF (Premix)	20	BLI555PA-1	1 ml
	100	BLI555PB-5	5 ml
	280	BLI555PC-14	14 ml
R-PE MESF	20	BLI827A-1	1 ml
	100	BLI827B-5	5 ml
	280	BLI827C-14	14 ml
PE-Cy™5 MESF	20	BLI828A-1	1 ml
Cy™5 MESF	20	BLI822A-1	1 ml
	100	BLI822B-5	5 ml
	280	BLI822C-14	14 ml
Alexa Fluor® 647 MESF	20	BLI647A-1	1 ml
	100	BLI647B-5	5 ml
	280	BLI647C-14	14 ml
APC MESF	20	BLI823A-1	1 ml
	100	BLI823B-5	5 ml
	280	BLI823C-14	14 ml

QuickCal® v. 2.3 Data Analysis Program

QuickCal® constructs a calibration curve associating fluorescence channel values to standardized fluorescence intensity units. Additionally, the channel value corresponding to the kit's blank bead is converted to the appropriate standardized fluorescence intensity unit (MESF or ABC); this will be the instrument's detection threshold for the specific reporter and detector. *For instructions regarding QuickCal®, please see Technical Data Sheet #PDS 819.*

Instrument Standards

Flow Applications

Cell Cycle Analysis

Fluorescence Reference Standards *adm*

Fluorescence Reference Standards are labeled with specific fluorochromes so that they give rise to the same fluorescence spectra as cells labeled with the same fluorochromes. Fluorescence intensity is similar to biological samples. Technical Data Sheets #PDS 890 and #PDS 892

	Tests	Catalog #	Size
Acridine Orange	20	BLI897A-1	1 ml
	100	BLI897B-5	5 ml
	280	BLI897C-14	14 ml
DAPI	20	BLI906A-1	1 ml
	100	BLI906B-5	5 ml
	280	BLI906C-14	14 ml
Fluorescein	20	BLI891A-1	1 ml
	100	BLI891B-5	5 ml
	280	BLI891C-14	14 ml
Hoechst 33342	20	BLI894A-1	1 ml
	100	BLI894B-5	5 ml
	280	BLI894C-14	14 ml
Propidium Iodide	20	BLI892A-1	1 ml
	100	BLI892B-5	5 ml
	280	BLI892C-14	14 ml

Viability Dye Compensation Standard *adm*

Viability Dye Compensation Standards are suitable for labeling with LIVE / DEAD® stains or similarily reactive dyes to generate compensation standards for flow cytometric analyses. Beads are not suitable for labeling with DNA stains such as propidium iodide, DAPI, or Sytox®, and users should contact Technical Service for discussion if uncertain as to the compatibility of a specific dye or stain. Technical Data Sheet #PDS 853

Nom. Dia.		
4µm	BLI450-3	3 ml
8µm	BLI451-3	3 ml

Cell Size Estimation

Size Calibration Standards Kit *dm*

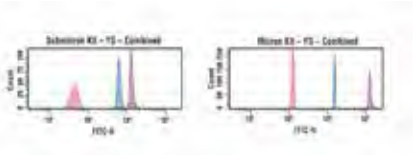
The Size Calibration Standards Kit includes five highly uniform unlabeled microbead populations of different diameters (~4 - 11µm), which can be used to construct calibration plots for electronic volume and light scatter instrumentation. Technical Data Sheet #829

Tests		
100	BLI829B-5	5 ml
280	BLI829C-14	14 ml

Instrument Standards

	Particle Concentration	Catalog #	Size
Small Bead Calibration Kits *A2adw*			
Submicron Bead Calibration Kit (0.2µm, 0.5µm, 0.8µm)	1 x 10^8 particles/ml	BLI832-1	1 kit
Micron Bead Calibration Kit (1.0µm, 3.0µm, 6.0µm)	2 x 10^6 particles/ml	BLI833-1	1 kit

Small Bead Calibration Kits *A2adw*
Current applications in flow cytometry extend far beyond traditional lymphocyte immunophenotyping, with some applications involving the analysis of very small particles such as platelet- and endothelial-derived microparticles or microbial species. Our Small Bead Calibration Kits allow operators to verify the resolution capabilities of the flow cytometer, and to establish appropriate instrument settings for these analyses. Microspheres are dyed with Yellow Green (YG) and are suitable for use with FITC-optics. Technical Data Sheet #916



Fluoresbrite® Calibration Grade Size Range Kit *A2dmw* . . . . . 18132-1 1 kit
Our unique synthesis methods routinely result in particles with fluorescence CV's less than 5% and often as low as 1%. A range of 5 sizes of Fluoresbrite® YG microspheres can be used to calibrate the green channel.

Kit Contains: 1ml at 2.5% solids for each nominal size: 0.5µm, 1.0µm, 2.0µm, 3.0µm and 6.0µm.

Cell Counting

Flow Cytometry Absolute Count Standard™ *A2adm* . . . . . BLI580-10 10 ml
The Flow Cytometry Absolute Count Standard™ consists of highly uniform, cell-sized microspheres labeled with a full spectrum dye and provided at a known concentration (~1 x 10^6). These beads fluoresce over a broad range of the spectrum, allowing them to be used as count standards in multiple detectors.

For additional count standards, please see our SureCount™ offerings on page 426.

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Technical Information

At Polysciences, we are committed to making the finest microspheres in the world, and providing the highest level of customer and technical service from initial discussions through the product lifecycle and beyond. We hope that you find this catalog to be helpful as you consider products for your work, and invite you to contact us if we may address any questions or be of assistance in formulating solutions to meet your specific needs.

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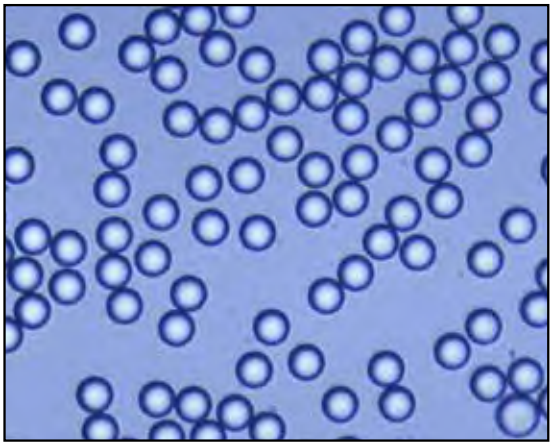


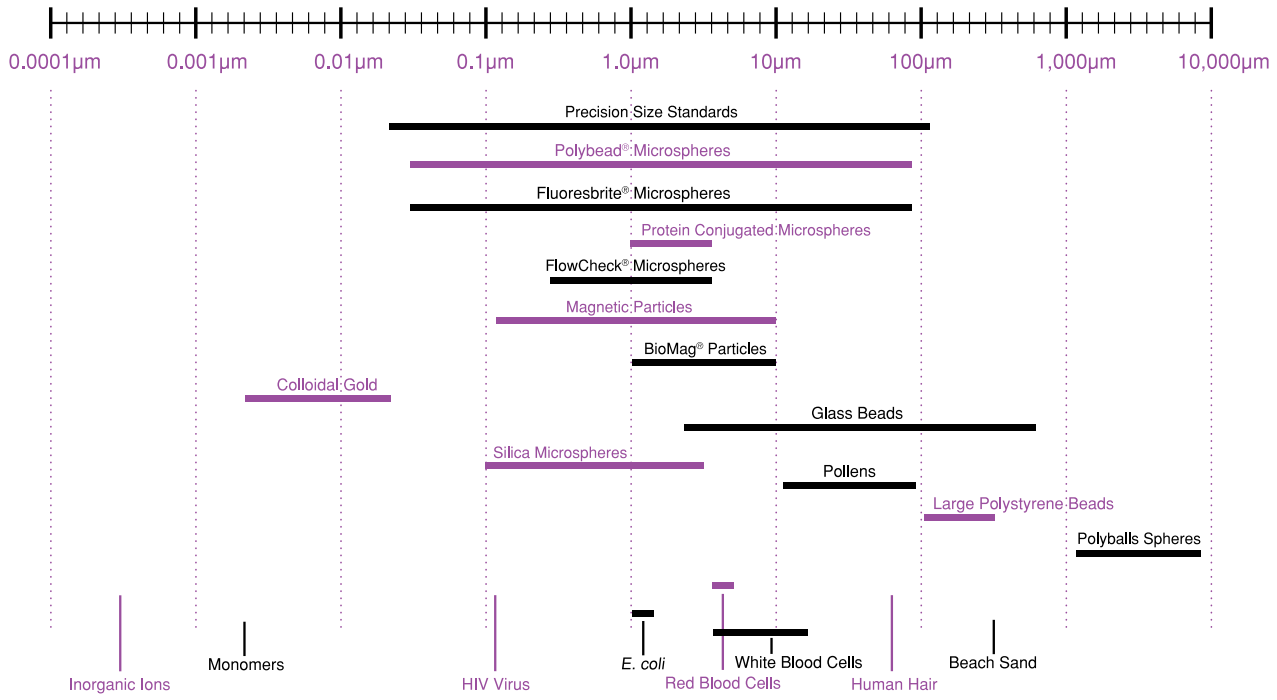
Well-dispersed 10µm Polybead® Microspheres

How Particles Measure Up

Precision Size Standards	0.04 - 175µm
Polybead® Microspheres	0.05 - 90µm
Fluoresbrite® Microspheres	0.05 - 90µm
Protein Conjugated Microspheres	1 - 6µm
Flow Check™ Microspheres	0.5 - 6.0µm
Magnetic Particles	0.2 - 10µm
BioMag® Particles	1.0 - 10µm
Colloidal Gold	0.005 - 0.06µm
Glass Beads	3 - 850µm
Silica Microspheres	0.1 - 5.0µm
Pollens	12 - 90µm
Large Polystyrene Beads	106 - 600µm
Polyballs	1,587.5 - 9,525µm
Inorganic Ions	0.0006µm
Monomers	0.0045µm
HIV virus	0.12µm
E. coli	1 - 2µm
Red Blood Cells	6 - 8µm
White Blood Cells	7 - 25µm
Human Hair	80µm
Beach Sand	650µm

How Polysciences' Microspheres and Other Particles Measure Up

1 Micron (µm) = 1,000 Nanometers = 10,000 Angstroms



Microsphere Selection

Microspheres offer a highly convenient and flexible system for developing reagents for assays and bioseparations and for use as instrument standards. As there are many varieties of microspheres available, it is important to think about the demands of the application when selecting a microsphere. Physical and optical properties should be considered in the context of handling and detection, and thought should also be given to requirements for diameter and size distribution, composition, surface chemistry and any other needed properties.

Property	Considerations
Size	Diameter, Uniformity / distribution
Composition	Density, Refractive index, Hydrophobicity / -philicity, Nonspecific binding, Autofluorescence
Surface chemistry	Reactive groups, Level of functionalization, Charge
Special properties	Visible dye / fluorophore, Superparamagnetic

Particle Size

Microsphere size may be critical to the proper function of an assay, or it may be secondary to other characteristics. Considering traditional diagnostic methods, the test or assay format commonly dictates particle size, such as the use of very small spheres (~0.1 - 0.4µm) to ensure satisfactory wicking in lateral flow tests, or the use of larger, cell-sized spheres (~4 - 10µm) for bead-based flow cytometric assays.

In magnetic separations, particularly those involving capture and elution of target, the exact size of the magnetic particle may be unimportant provided that the particles are in some general size range and offer desired separation characteristics.

Diameter also determines surface area. Small-diameter spheres present more surface area per unit mass, while larger spheres present more surface area per bead. Size also effects ease of handling, process considerations (such as the method used for separations [centrifugation, dialysis, filtration]) and the amount of reagent needed for coating.

All sizes listed in this catalog are nominal. For most products, the mean diameter of your particles will be printed on the label with the standard deviation.

Particle Composition

Common microsphere compositions include polystyrene (PS), poly(methyl methacrylate) (PMMA) and silica. These materials possess different physical and optical properties, which may present advantages or limitations for different applications.

Polymer beads are generally hydrophobic, and as such, have high protein binding abilities. However, they often require the use of some surfactant (e.g. 0.01 - 0.1% Tween® 20 or SDS) in the storage buffer to ensure ease of handling. During synthesis, functional monomers may be co-polymerized with styrene or methyl methacrylate to develop beads with reactive surface groups. Functional groups may be used in covalent binding reactions and also aid in stabilizing the suspension.

Silica microspheres are inherently hydrophilic and negatively-charged. Consequently, aqueous silica suspensions rarely require the use of surfactants or other colloidal stabilizers. Carboxyl- and amine-functionalized silica spheres are available for use in common covalent coating protocols, and plain silica microspheres may be modified using a variety of silanes to generate functional groups or alter surface properties.

Composition	Refractive Index (589nm)	Density (g/cm^3)	Glass Transition Temperature (˚C)
PS	1.59	1.05	95
PMMA	1.49	1.19	105
Silica	1.43 - 1.46*	2.0*	>>1000

**Determined using representative samples. Other values are as reported in the literature for bulk polymer or silica.*

Common Test and Assay Formats

Test / Assay Format	Bead Size	Bead Type	Coating Strategy	Detection Strategy
Flow cytometric (suspension array)	2 - 15µm	QuantumPlex™, QuantumPlex™M (encoded populations for multiplexing), Non-fluorescent (simplex or multiplex with different bead sizes)	Covalent, Streptavidin / biotin	Flow cytometer
Lateral Flow	0.1 - 0.4µm	Dyed (visible or fluorescent)	Covalent, Adsorption	Visual or automated reader (absorbance, fluorescence), Visual
Lateral Flow - Boulders in the Stream	0.1 - 0.4µm mobile phase, ~2 - 3µm capture phase	Dyed (visible) mobile phase, Undyed capture beads	Covalent, Adsorption	Visual
Dipstick	0.1 - 0.4µm	Dyed (visible)	Covalent, Adsorption	Visual
Latex Agglutination Tests (LATs)	0.2 - 1.0µm	Undyed, Visibly dyed	Covalent, Adsorption	Visual (may be microscope-assisted)
Turbidimetric (Automated LAT)	50nm - 500nm	Undyed	Covalent	Turbidimetry

Magnetic Assays

Assays	Suggested Products
Immunoassays	ProMag™, ProMag™ HP, ProMag™ HC or BioMag®
Hybridization-based assays	ProMag™ and ProMag™ HC

Magnetic Separations

Magnetic Separations	Suggested Products
Cells	BioMag® anti-CD marker or secondary antibody
Subcellular organelles	BioMag®
Immunoprecipitates	BioMag® secondary antibody
mRNA	BioMag® Oligo dT(20) or mRNA Purification System
Biotinylated oligonucleotide capture or binding	ProMag™ or BioMag® Streptavidin
Biopanning	ProMag™ or BioMag®
Glycoproteins	BioMag® Wheat Germ Agglutinin or BioMag® Concanavalin A

Special Properties

Many applications in the life sciences demand added properties such as fluorescence or a visible color, or iron oxide inclusions for magnetic separations. Polymer spheres (and some polymer-based magnetic spheres) are often internally dyed via organic solvent swelling and many standard products are available. Dye concentrations can be adjusted to produce beads with different intensities to meet special needs, such as QuantumPlex™ for multiplexed flow cytometric assays or our Dragon Green or Flash Red Intensity Standards, which support imaging applications and associated instrument QC. Many surface- or internally-labeled fluorescent beads are also available as specialized flow cytometry standards.

Various types of superparamagnetic microparticles are available, with different matrices, magnetite content, surface groups, etc. For new assays or applications, magnetic beads should be evaluated with application demands in mind.

General Handling

Particle Suspension

The number of particles per ml will vary with the specified weight to volume (w / v) concentration, diameter of the particle and density of particle composition. The number of particles per milliliter can be calculated using the following equation:

$$\frac{6x \bullet 10^{12} \bullet \rho_L}{\rho_S \bullet \pi \bullet z^3}$$

x = solids content (g/ml)
ρ_S = density of solid sphere (g/cm^3)
z = diameter (µm)
ρ_L = density of bead suspension (g/ml)
$\rho_L = 100 \bullet \rho_S / [100 \times (1 - \rho_S) + (100 \bullet \rho_S)]$

The following grid gives the estimated particles per milliliter for common diameters of polystyrene beads (ρ = 1.05 g/ml) suspended at 2.5% solids (w / v) and silica beads (ρ = 2.0 g/ml) suspended at 10% solids, at common diameters:

Diameter (µm)	Polystyrene 2.5% Solids (particles/ml)	Silica 10% Solids (particles/ml)
0.05	3.64×10^{14}	N/A
0.10	4.55×10^{13}	1.00×10^{13}
0.20	5.68×10^{13}	1.26×10^{13}
0.35	1.06×10^{12}	2.34×10^{12}
0.50	3.64×10^{11}	8.04×10^{11}
0.75	1.08×10^{11}	2.38×10^{11}
1.00	4.55×10^{10}	1.00×10^{10}
1.50	1.35×10^{10}	2.98×10^{10}
2.00	5.68×10^{9}	1.26×10^{10}
3.00	1.68×10^{9}	3.72×10^{9}

Diameter (µm)	Polystyrene 2.5% Solids (particles/ml)	Silica 10% Solids (particles/ml)
4.50	4.99×10^{8}	1.10×10^{9}
6.00	2.10×10^{8}	4.65×10^{8}
10.0	4.55×10^{7}	N/A
15.0	1.35×10^{7}	N/A
20.0	5.68×10^{6}	N/A
25.0	2.91×10^{6}	N/A
45.0	4.99×10^{5}	N/A
75.0	1.08×10^{5}	N/A
90.0	6.24×10^{4}	N/A

Surface to Volume Ratios

Use these formulas as a rough guide to estimate the surface area or the volume of a sphere. Determination of the surface area of polystyrene spheres is complicated by the unique form of the polymer. These beads are made by the formation of many single chain polymers which may be likened to a ball of wool. Thus, the surface area may be much greater than that predicted by the simple formula. This is particularly important for protein binding applications and charge calculations.

Surface Area = $4 \pi r^2$

Volume = $4 / 3 \pi r^3$

Handling and Storage

Our microspheres are synthesized in water and should be stored in aqueous environments. Deionized water is the best suspending medium for uncoated spheres as high concentrations of ions may result in aggregation. Coated microspheres should be stored in buffers that are appropriate for the ligand that is bound to the surface. Storage of particles over long periods of time should be at 4°C to deter the growth of microbes, and the particle suspensions must not be allowed to freeze. Dyed and fluorescent particles should be protected from light. Biocides may be added for extended storage.

Washing

Microspheres sold as instrument standards can often be used as-is, or simply diluted in an appropriate buffer or aqueous solution. Conversely, microspheres that will be coated or otherwise modified should be washed to remove additives and residuals that could interfere with the binding reactions or other processes.

Common washing and separation methods for non-magnetic beads include centrifugation, filtration and dialysis. Selection of the "best" method will depend on scale, required throughput and microsphere characteristics. Centrifugation is often used for small-scale separations of ≥0.5µm, dialysis for spheres <0.5µm and filtration for small spheres <0.5µm, or to achieve higher throughput. Superparamagnetic microparticles are separated using rare earth or electro-magnets.

Centrifugation

Particle washing may be conducted via centrifugation. This procedure must be performed carefully as excessive centrifugation may result in resuspension difficulties. Though centrifugation of BioMag® magnetic particles is not recommended, ProMag™ may be processed in this way. For the purposes of pelleting, it is important to understand the settling velocities of particles. For spherical particles, settling velocity can be calculated using Stokes' Law:

$$V = \frac{2Ga^2(\rho_1 - \rho_2)}{9n}$$

V = Velocity (cm/sec)
G = G force (1G = 980.7 cm/sec^2)
ρ_1 = density of particle (g/cm^3)
ρ_2 = density of suspending media (g/cm^3)
n = coefficient of viscosity (poise; g/cm-sec)
a = radius of spherical particle in cm

For calculating the settling velocity of polystyrene spheres at 1 G in 20°C water, Stokes' Law can be expressed in the following formula where d = diameter (µm) (ρ_1 = 1.05 g/cm^3, ρ_2 = 1.00 g/cm^3 and n = 1.002 cp); V= 2.77 x 10^{-6} d^2. To estimate appropriate times for centrifugation, settling velocity is multiplied by the G forces generated by the centrifuge. The resultant velocity is then compared to the height of the centrifuge tube.

For example:
A 1.0µm polystyrene particle placed in a microcentrifuge generating 10,000 G will settle at a velocity of 2.72 x 10^{-2} cm/sec.

Pelleting the particle in a 4cm high tube would require a 144 second (minimum) centrifuge run. The actual time required to form an acceptable pellet could possibly be 50% longer. These calculations are intended to be used as guidelines to assist in determining centrifugation time. Different size particles yield dramatically different settling velocities. A 10.0µm particle could settle in 2 seconds under the aforementioned conditions, whereas a 0.01µm particle could take at least 4 hours to settle. Brownian motion and particle concentration also affect the settling rate.

Aggregation

Our microspheres are available in a variety of compositions, including polystyrene, poly(methyl methacrylate), and silica. Though polymer microspheres are more susceptible to hydrophobic-mediated aggregation, there are several factors that may influence the dispersity of the suspension. For example, low surface charge, small diameter (high surface area : volume ratio), high microsphere concentration and suboptimal buffer composition or pH may promote aggregation. Strategies that are effective in addressing aggregation thus counter these conditions, i.e. use of surfactant to reduce hydrophobicity (e.g. 0.01 - 0.1% Tween® 20 or SDS), sonication to disrupt aggregates and adjusting microsphere concentration or buffer pH to deter contact between individual spheres.

Coating Microspheres

General Information

Microspheres may be coated with capture molecules such as antibodies, oligonucleotides, peptides, etc. for use in diagnostic or separation applications. Microsphere coatings are typically optimized to achieve desired specific activity, while minimizing nonspecific interactions. Consideration should also be given to the required stability, development time frame and budget and the specific biomolecule to be coated. These factors will aid in determining the most fitting coating strategy for both short- and long-term objectives.

Standard microsphere products support three basic coating strategies: passive adsorption, covalent coupling and affinity binding. It is important to note that each binding strategy has benefits and limitations, which should be weighed in the context of study objectives and the demands that will be placed upon the finished reagent.

Passive Adsorption

Passive adsorption relies primarily on hydrophobic interactions between the biomolecule and the polymer particle. Such coatings are fairly simple to conduct, involving incubation of the microspheres with the purified ligand. They typically require little optimization and reagents may be developed relatively quickly. However, as adsorption relies on the formation of multiple attachment points between the molecule and the particle, this strategy is typically reserved for use with proteins and non-functionalized polymer spheres. Adsorption is generally not suitable for hormones, peptides or nucleic acids in hybridization-based applications, and protein adsorption to silica is expected to be less efficient than to polymer. Most techniques using passive adsorption technology report four to six months of bead stability. The reagent may be lyophilized for extended stability.

Covalent Coupling

Covalent coupling results in the permanent attachment of the molecule to the functionalized (e.g. carboxyl or amine) microsphere. It can provide needed stability when developing a commercial reagent, and for multiplexed assays, where analyte-specific bead populations are mixed. Additionally, specialized chemical linkers may be employed to address steric effects or to optimally orient the molecule. If surfactant is required as an additive in the assay, covalent coupling procedures are recommended as surfactants can displace adsorbed proteins from the surface. Covalent binding is also important for the immobilization of oligonucleotides or peptides, where end-point attachment is required. Although covalent binding protocols often involve a higher level of optimization than other approaches, coupling kits are available to simplify the process.

When Coupling to Particles Less Than 0.5µm

The chemical aspects of the protocols are universally applied, but the mechanical separations of these particles must be adapted for specific sizes. Most protocols suggest centrifugation to separate the particles from the reagents. This is not practical for particle sizes less than 0.5µm, as most microcentrifuges cannot spin these particles down within 30 minutes. Even extremely high G forces are not recommended, as resuspension becomes arduous. Other separation techniques may be utilized, such as dialysis, forced membrane filtration or centrifugal filter devices. Polysciences also offers coupling kits that use hollow fiber filtration techniques in addition to Vivaspin® Ultrafiltration devices to effect separation of 0.1-0.5µm particles.

Affinity Binding

Affinity binding is a straightforward method for immobilizing primary antibodies or tagged molecules. Proteins A and G and Fc-specific antibody coatings permit the directed immobilization of primary antibodies, and streptavidin (SA) is used extensively for the binding of biotinylated molecules, such as antibodies, peptides and oligonucleotides.

Biomolecule	Coating Strategy	Notes
Peptides	Covalent Streptavidin / biotin	End-point attachment to preserve the activity of the peptides.
Nucleic acids	Covalent Streptavidin / biotin	End-point attachment to permit hybridization of probe sequence with target sequence.
Proteins (e.g. antibodies)	Covalent Adsorption Streptavidin / biotin Proteins A / G	Common proteins are generally large enough that multi-point attachment and nonspecific orientation do not compromise their activity. However, linkers, spacers (covalent or SA / B) or affinity ligands may be employed to address steric effects or sub-optimal orientation.

Alternative for BSA as a Blocking Agent

Any innocuous protein may be used to block the effects of non-specific adsorption. In selecting an alternative to BSA, it is suggested that the size of the active protein and the size of the blocking protein be compared. BSA is highly recommended for IgG coupling. However, the large size of BSA could obscure the activity of smaller active proteins. Glycine or small polypeptides may be used as alternatives.

Protein Coupling Efficiency Determination

Coupling efficiency can be determined by measuring the change in absorbance of the supernatant before and after coupling.

1. Set spectrophotometer wavelength to 280nm. Blank with the Coupling Buffer.
2. Measure the absorbance of the Pre-Coupling Solution. A further dilution may be necessary to read an absorbance depending upon the amount of protein added (D = dilution factor).
3. Measure the absorbance of the Post-Coupling Solution. A dilution may be necessary to read the absorbance (D = dilution factor).
4. Calculate the coupling efficiency, expressed as the % Protein Uptake, as follows. Typical values of Protein Uptake are >60%.

$$\left[\frac{(A_{280}\ \text{Pre-Coupling Solution}_1 \times D) - (A_{280}\ \text{Post-Coupling Solution}_2 \times D)}{(A_{280}\ \text{Pre-Coupling Solution}_1 \times D)} \times 100 \right]$$

Protein Binding Protocols

The following sequences serve as guidelines for protein binding. Technical Data Sheets (TDS) with detailed step-by-step protocols can be downloaded from our website, and ligand-specific immobilization protocols may be found in the literature.

Adsorbing Protein on Particles TDS #238E	Coupling by Carbodiimide TDS #238C & #644	Coupling by Glutaraldehyde TDS #238D & #238G
Plain Polystyrene	**Carboxylate Functional Particles**	**Amino or Blue Dyed Particles**
• Initial Buffer: 0.1M Borate Buffer, pH 8.5	• Initial Buffer: 0.1M Carbonate Buffer	• Initial Buffer: 0.02M PBS, pH 7.4
• Suspend in buffer, spin down and resuspend 2 or 3 times.	• Suspend in buffer, spin down and resuspend 2 or 3 times.	• Suspend in buffer, spin down and resuspend 2 or 3 times.
• Suspend in borate buffer.	• Suspend in MES buffer.	• Suspend in PBS.
• Add protein and mix end-to-end overnight.	• Add fresh carbodiimide solution dropwise and incubate for 15 - 30 minutes.	• Suspend in 8% glutaraldehyde in PBS, pH 7.4 and mix end-to-end for 4 - 6 hours.
• Spin and save supernatant for protein determination.	• Wash to remove excess carbodiimide, then resuspend in borate buffer.	• Wash to remove excess glutaraldehyde and resuspend in PBS buffer.
• Re-suspend in BSA in appropriate buffer and spin down twice.	• Add protein and mix end-to-end for 2 - 4 hours.	• Add protein and mix end-to-end overnight.
• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).	• Add ethanolamine, mix for 30 minutes.	• Add ethanolamine, mix for 30 minutes.
• Protein bound directly on surface.	• Spin and save supernatant for protein determination.	• Spin and save supernatant for protein determination.
	• Re-suspend in BSA-containing buffer and spin down twice.	• Re-suspend in BSA-containing buffer and spin down twice
	• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).	• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).
	• Protein bound 2 - 3 carbon atoms from surface.	• Protein bound 5 carbon atoms from surface of blue dyed beads and 11-12 carbon atoms from surface of amino beads.

Protein Coupling Troubleshooting

Below are some solutions for protein coupling troubleshooting. If you do not see a solution to the problem you have encountered, please email us at **info@polysciences.com**.

Problem	Solution
Clumping prior to use	Careful sonication
Clumping after procedure • Carbodiimide addition causes clumping • Glutaraldehyde addition causes clumping • Protein addition causes clumping • Washing causes clumping	Isolate the step that causes clumping • Add slowly, agitate beads, decrease bead concentration • Add slowly, agitate beads, decrease bead concentration; add an excess of glutaraldehyde to avoid chemical crosslinking of particles; clumping will typically resolve by the conclusion of protein coupling • Increase protein concentration • Add surfactant or reduce number of washing steps
Low binding	Move pH closer to protein isoelectric point
Variable coating	Use pure water – no contaminants; use fresh reagents
Coating, but no reaction	Optimize pH away from isoelectric point
Centrifuge not practical	Use membrane filtration, dialysis, or spin filters for small particles
Nonspecific adsorption	Use an alternative for BSA (glycine, casein)
Small proteins bound, but not reactive	Use a crosslinking reagent to extend coupling away from the surface of the bead
Long-term storage leaches protein	Try covalent attachment or lyophilize final product

Polystyrene Microspheres

Polystyrene Microsphere General Characteristics

Parameter	Description
Size	0.05 - 150µm for a wide range of applications
Monodispersity	Coefficient of variance ≤15% for most size ranges, 0.05 - 90µm
Concentration	2.5%
Suspending medium	DI water with residual surfactant to ensure stable dispersions
Color	Undyed, red, yellow, black, blue, violet, orange, green and several fluorescent colors
Functionality	Plain, COOH, $-NH_2$ and -OH.
Stability	Inert, safe for handling and ideal for biological studies
Protein Affinity	Covalent coupling for functionalized spheres or passive adsorption possible
Glass Transition	~94˚C, stable to moderate heating temperature; some diameters feature a low level of DVB crosslinking
Bead Density	~1.05 g/cm^3, similar to cell densities
Refractive Index (589nm)	~1.59 - 1.60, ideally suited for applications
Biocides	None (except where noted); particles are compatible with azide, ProClin® and other treatments.

Polystyrene Microsphere Stability

Polysciences offers a one year shelf life for most products. Unless noted, biocides are not added and the particles are shipped in DI water with residual surfactant. All polystyrene products should be stored at 4˚C to prevent microbial growth. Microsphere suspensions must be protected from freezing to safeguard against irreversible aggregation. If long-term storage is required, the addition of biocide is recommended.

Polystyrene Microsphere Monodispersity

The following chart lists our specifications for the uniformity of our particles, expressed as the coefficient of variance (CV). The actual diameter (D) and the standard deviation (SD) for each lot is printed on the label. The % CV is expressed as the SD / D x 100.

Diameter (µm)	CV Maximum (%)
0.05	≤15
0.10	≤15
0.20	≤8
0.35	≤5
0.50	≤3

Diameter (µm)	CV Maximum (%)
0.75	≤3
1.00	≤3
1.5	≤5
2.00	≤5
3.00	≤5

Diameter (µm)	CV Maximum (%)
4.50	≤7
6.00	≤10
10.00	≤10
15.00 - 90.00	≤15

Polystyrene Microsphere Sterility and Shelf Life

Our polystyrene microspheres are packaged as non-sterile suspensions. We have made the decision to give the customer the option of adding biocides or preservatives into the product upon receipt. The particles will be stable for up to one year after the date of sale. Degradation of the particles, their functional groups or the incorporated dyes is not expected under normal conditions and our primary concern is the quality of the DI water. We make every effort to ensure that our water source and packaging procedures will allow us to meet our one year shelf life. If a sterile product is necessary, then the particles may be gamma irradiated. Additions of biocides, such as thimerosol or sodium azide, are common. For research applications involving *in vivo* studies or live cells, the particles can be suspended in alcohols prior to use. See Technical Data Sheet #670, *Decontaminating Microspheres,* for more information.

Embedding Tissues Containing Polystyrene Microspheres

Polystyrene microspheres have been visualized by light microscopy in unembedded coverslip monolayers, in fixed or unfixed frozen sections, in paraffin sections and in glycol methacrylate kits. For paraffin sections, n-butyl alcohol must be used for clearing and deparaffination since typical organic solvents (e.g. toluene, THF, or ethyl acetate) will destroy the beads. The beads cannot be embedded in methyl or butyl methacrylate media. TEM embedments in Epon and Spurrs have been successful.

Polybead® and Fluoresbrite® Dyed Particles

Types of Dyes Used

Our Fluoresbrite®, Polybead® and some Flow Check™ product feature water insoluble dyes*. This minimizes the incidence of dye leaching from the particles into aqueous buffers. Our visibly dyed microspheres are available as black, blue, red, violet, orange, green and yellow. Other colors and intensities are available on a custom basis. Many of the Bangs Flow Cytometry Standards are "surface dyed" with the same fluorochromes used for making antibody conjugates. Polysciences can custom manufacture Fluoresbrite® particles with a customer's dye of choice. Polysciences' most popular fluorescent dyes match the following filter settings:

Fluorescent Particles	Filter Setting	Dyed Particle	Excitation Max. (nm)	Emission Max. (nm)
BB (Bright Blue)	Coumarin	BB	360	407
YG (Yellow Green)	Fluorescein	YG	441	486
YO (Yellow Orange)*	Rhodamine	YO	529	546
PC (Polychromatic Red)	Phycoerythrin	PC	491; 512	554
		Ruby Red	475; 590	663
		FITC	492	512
		R-PE	480; 565	578
		Sulforhodamine	540	645
		APC	650	660

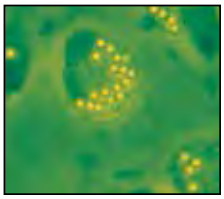
** YO has limited water solubility; some leaching may occur with rigorous washing.*

Dyed Microspheres and Microscopy

A 6µm visibly dyed (non-fluorescent) particle is the smallest particle whose color can reasonably be observed under light microscopy conditions (400x). Infinite magnification of a dyed particle will result in an undyed appearance. Fluorescently-labeled Fluoresbrite® microspheres are recommended for microscopic viewing of particles smaller than 6µm. Fluoresbrite® 0.05µm particles have been identified using a fluorescent microscope set at 100x objective and 10x ocular magnification.

Fluoresbrite® for Phagocytosis or Retrograde Transport

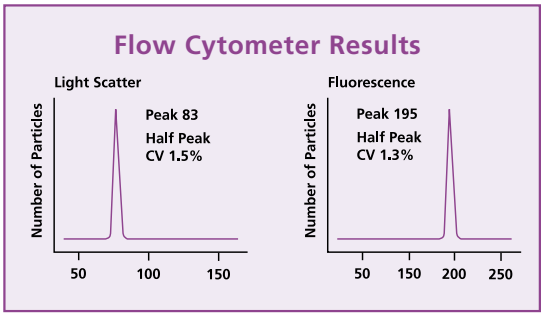
Uniform polystyrene particles are ideal for cellular studies. Microspheres are easily identified by their intense fluorescence, and polystyrene has long been recognized as a biologically active surface for cell attachment. See *Technical Data Sheet #430* for more information on phagocytosis studies.



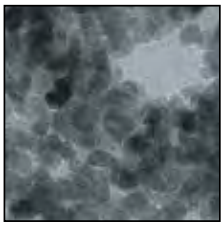
Fluoresbrite® to Calibrate Flow Cytometers

Our Fluoresbrite® Calibration Grade particles have had a long history of use as flow cytometry standards. We also carry the extensive line of Bangs Flow Cytometry Standards. See *Technical Data Sheet #431* for more information.

Data for the chart to the right was obtained on a EPICS V instrument with fluorescent polystyrene beads, 2µm in diameter. Data courtesy of Kristi Harkins, University of Nebraska / Lincoln.



BioMag®, BioMag®Plus and BioMag® Maxi



BioMag® Physical Characteristics

Our conventional BioMag® are irregularly-shaped iron oxide particles that are approximately 1-2µm in size. BioMag®Plus are similar, but have undergone additional processing for the reduction of outliers. BioMag® Maxi are ~6µm. Functionalized versions are covered with a silane coating that provides functional groups for the attachment of proteins or antibodies. The irregular shape of the BioMag®, BioMag®Plus and BioMag® Maxi particles provide increased surface area and therefore increased binding capacity per unit mass.

BioMag® particle surface area:	>100 m^2/g
BioMag® particle density:	>>2.5 g/cc
BioMag® settling rate:	4% in 30 minutes

BioMag® Stability

As the BioMag® base particle is composed of coated iron oxide, the particle itself is very stable. However, any proteins or antibodies attached to BioMag® particles are susceptible to degradation over time. BioMag® should not be frozen or exposed to elevated temperatures.

BioMag® Stability in Solvents

BioMag® particles have been used in various coupling buffers at pH ranging from 5.5 to 8.0. Low pH buffers can be problematic for BioMag®. It is best to test BioMag® in advance of exposure to organic solvents or extreme pH conditions.

BioMag® Magnetic Responsiveness

BioMag® particles are superparamagnetic. In other words, they have no magnetic memory and will readily re-suspend if the magnetic force is removed. The particles are greater than 90% magnetite in composition and have a magnetization of 25 - 35 emu/g (Electromagnetic Units).

Positive and Negative Selection with BioMag®

BioMag® particles can be used for both positive and negative selections. In negative selection, the unwanted components are bound and pulled out of solution by the BioMag® particles. After magnetic separation, the resulting supernatant is enriched for the target cells or molecules. In positive selection schemes, the BioMag® particles are used to pull out of solution only the target cells or molecules of interest. Unwanted cell populations and other sample constituents will be discarded with the supernatant, resulting in a purified suspension of the target components.

Magnetic Separator for BioMag®

Small superparamagnetic particles such as BioMag® require a strong magnetic field for efficient separation. Polysciences' magnets offer optimal performance, featuring rare earth (Neodymium-Iron-Boron) magnets embedded in plastic housings, with magnetic strengths ranging from 27 - 35 megagauss Oersteds. See *Technical Data Sheet #796* for additional information on the magnetic separators offered.

For complete technical information for each BioMag® product, refer to the appropriate Technical Data Sheet.

Flow Cytometry Quality Control

Validation / Quality Control

An instrument validation / Quality Control (QC) program will depend on the type and complexity of the work being performed on the instrument. A multi-fluorescent bead such as Full Spectrum™ allows operators to run a single product to check basic function and track general stability of all of the lasers / detectors. It will also be important to understand the sensitivity, resolution and linearity of different detectors. Linearity determinations are particularly important for quantitative fluorescence analyses.

Instrument Set-Up

Flow cytometers are highly configurable, and results can vary dramatically with different instrument settings. Establishing a common "Window of Analysis" for each detector with the upper and lower fluorescence limits defined, allows reference populations to be positioned in approximately the same place on the same scale. This may be accomplished with the aid of Quantum™ QC or Full Spectrum™. If multi-color analyses are being performed, compensation standards will likely be required to tailor settings.

Applications

There are many different types of studies that can be conducted on a flow cytometer. This might include quantitative surface marker expression analysis (Quantum™ MESF, Quantum™ Simply Cellular®), absolute counting (Flow Cytometry Absolute Count Standard™), size estimation (Small Bead Calibration Kits, Size Calibration Standard Kits), or various fluorescence analysis (Fluorescence Reference Standards). For product-specific information, please see pages 348 - 362.

The chart that follows provides additional product recommendations for specific tasks / objectives, and we additionally invite you to contact us to discuss the specific requirements of your program.

Quantum™ APC MESF Kit

Category	Purpose	Frequency	Products
Daily QC	General check of instrument stability / status	Daily	Full Spectrum™ (multi) Ultra Rainbow Fluorescent Particles (multi) Fluorescence Reference Standards (single) Flow Check™ Ruby Red Fluorescent Microspheres (single) Quantum™ QC
Daily QC	General check of instrument optical system	Daily	Full Spectrum™ (multi) Ultra Rainbow Fluorescent Particles (multi) Fluorescence Reference Standards (single) Flow Check™ Ruby Red Fluorescent Microspheres (single) Quantum™ QC
Daily QC	Optical alignment	Daily	Right Reference Standard™ Flow Check™ Alignment and Compensation Particle Sets
Daily QC	Fluidics check	Daily	Surface-labeled fluorescent microspheres, e.g. Fluorescence Reference Standards, Quantum™ MESF
Weekly QC	Optical system sensitivity, resolution for linearity (for specific lasers / PMTs)	Weekly	Quantum™ QC
Daily Set-Up	Standardized instrument set-up (PMTs)	Daily or between runs if settings are changed	Quantum™ QC
Daily Set-Up	Standardized compensation settings for multi-color analyses	Daily or between runs if settings are changed	FITC/PE Compensation Standard Simply Cellular® Compensation Standard, Quantum™ Simply Cellular® Viability Dye Compensation Standard Simply Cellular for Violet Laser
Application	Fluorescence quantitation in cellular expression studies or bead-based assays	Daily when quantitative analyses are performed or between different applications, if fluorescence PMT settings are changed	Quantum™ MESF Quantum™ Simply Cellular®
Application	F:P ratio determination for quantitative fluorescence analyses	As needed, i.e. with each new lot of fluorochrome-conjugated antibody	Simply Cellular® (used in conjunction with Quantum™ MESF)
Application	Compensation for multi-color flow cytometry	Daily or between different applications if fluorescence PMT settings are changed	FITC / PE Compensation Standard Simply Cellular® Compensation Standard Quantum™ Simply Cellular® Viability Dye Compensation Standard Simply Cellular ® for Violet Laser, Fluorescence Reference Standards (single) Flow Cytometry Antibody Binding Beads (Protein A and G)
Application	Cell counting	As needed	Flow Cytometry Absolute Count Standard™
Application	Cell size estimation	As needed	Size Calibration Standards Kit Submicron Bead Calibration Kit Micron Bead Calibration Kit
Application	Suspension array	Platform for development of bead-based flow cytometric assays	QuantumPlex™ QuantumPlex™M

Technical Data Sheets

Accessory Reagents

- TDS #606 *MicroKros Hollow Fiber Filter*
- TDS #793 *Polysciences Bead Solution*
- TDS #794 *Polysciences Bead Coupling and Storage Buffers*
- TDS #911 *Accessory Reagents*
- TDS #912 *Surfactants*

Additional Microparticles

- TDS #281 *Sporopollenin Microparticles*
- TDS #604 *Iron Powder*
- TDS #605 *Black Iron Oxide Particles*
- TDS #607 *Red Iron Oxide Particles*
- TDS #744 *Hollow Glass Beads*
- TDS #758 *Glass Beads*
- TDS #783 *Phenolic Beads, Hollow*
- TDS #784 *Polybead® Hollow Microspheres*
- TDS #857 *Glass Beads*
- TDS #858 *PLGA Uniform Dry Microspheres*

Dyed Microspheres

- TDS #808 *Polybead® Dyed Microspheres*

Flow Cytometry Products

- TDS #508 *FlowCheck™ Microspheres*
- TDS #613 *FlowCheck™: Flow Cytometry Particles and Sets*
- TDS #624 *FlowCheck™ Ruby Red Fluorescent Microspheres*
- TDS #914 *Flow Cytometry Instrument Quality Assurance / Quality Control Program*
- TDS #916 *Small Bead Calibration Kits*
- TDS #PDS 214 *QuantumPlex™ SP Streptavidin*
- TDS #PDS 215 *QuantumPlex™ Streptavidin*
- TDS #PDS 234 *QuantumPlex™ SP Carboxyl*
- TDS #PDS 235 *QuantumPlex™ Carboxyl*
- TDS #PDS 250 *QuantumPlex™M Carboxyl*
- TDS #PDS 251 *QuantumPlex™M SP Carboxyl*
- TDS #PDS 252 *QuantumPlex™M Streptavidin*
- TDS #PDS 253 *QuantumPlex™M SP Streptavidin*
- TDS #PDS 510 *Right Reference Standard™*
- TDS #PDS 612 *Ultra Rainbow Fluorescent Particles*
- TDS #PDS 704 *Fluorescence Intensity Standards*
- TDS #PDS 725 *Quantum™ QC*
- TDS #PDS 810 *Simply Cellular® anti-Mouse IgG*
- TDS #PDS 812 *Simply Cellular® anti-Human IgG*
- TDS #PDS 813 *Simply Cellular® anti-Rat IgG*
- TDS #PDS 814 *Quantum™ Simply Cellular®*
- TDS #PDS 820 *FITC / PE Compensation Standard*
- TDS #PDS 821 *Quantum™ MESF Kits*
- TDS #PDS 829 *Size Calibration Standards Kit*
- TDS #PDS 831 *Time Delay Calibration Standard*
- TDS #PDS 835 *Simply Cellular® anti-Mouse for Violet Laser*
- TDS #PDS 850 *Simply Cellular® anti-Mouse Compensation Standard*
- TDS #PDS 851 *Simply Cellular® anti-Rat Compensation Standard*
- TDS #PDS 852 *Simply Cellular® anti-Human Compensation Standard*

Flow Cytometry Products con't.

- TDS #PDS 853 *Viability Dye Compensation Standard*
- TDS #PDS 854 *Flow Cytometry Protein A and Protein G Antibody Binding Beads*
- TDS #PDS 880 *Flow Cytometry Absolute Count Standard™*
- TDS #PDS 885 *Full Spectrum™*
- TDS #PDS 890 *Fluorescence Reference Standards*
- TDS #PDS 892 *Alexa Fluor® Reference Standards*
- TDS #917 *Quantitative Cytometry*
- TDS #PDS 818 *Quantum™ Simply Cellular® and Quantum™ MESF Tips and Techniques*
- TDS #PDS 819 *QuickCal®, v 2.3 Data Analysis Program*

Fluorescent Microspheres

- TDS #431 *Fluoresbrite® Microparticles – Frequently Asked Questions*
- TDS #745 *Microsphere Excitation and Emission Spectra*
- TDS #913 *StarLight™ Calibration Slides*
- TDS #915 *Fluoresbrite® Europium Chelate Microspheres*

Informational Data Sheets

- TDS #410 *Microsphere Coating Reagents*
- TDS #430 *Phagocytosis and Microparticles*
- TDS #670 *Decontaminating Microspheres*
- TDS #753 *Streptavidin-Coated Microspheres Binding Biotinylated DNA*
- TDS #788 *Microsphere Selection*

Magnetic Microparticles

- TDS #438 *Magnetic Microparticles*
- TDS #528 *BioMag® and Cell Sorting*
- TDS #528A *BioMag® and Cell Sorting References*
- TDS #529 *BioMag® Oligo (dT) 20*
- TDS #530 *BioMag® Nuclease-free Streptavidin*
- TDS #531 *BioMag® Coupling Procedures for Attaching Oligonucleotides*
- TDS #546 *BioMag® Magnetic Immobilization Kit & BioMag® Amine*
- TDS #547 *BioMag® Superparamagnetic Iron Oxide*
- TDS #548 *BioMag® Goat anti-Rat IgG (Fc Specific)*
- TDS #549 *BioMag® Goat anti-Mouse IgG*
- TDS #550 *BioMag® Goat anti-Mouse IgG (Fc Specific)*
- TDS #551 *BioMag® Streptavidin*
- TDS #552 *BioMag® Biotin*
- TDS #553 *BioMag® Protein A*
- TDS #554 *BioMag® Protein G*
- TDS #555 *BioMag® Dextran-coated Charcoal*
- TDS #557 *BioMag® Goat anti-Rat IgM*
- TDS #558 *BioMag® Goat anti-Mouse IgM*
- TDS #559 *BioMag® Goat anti-Rabbit IgG*
- TDS #560 *BioMag® Goat anti-Rat IgG*
- TDS #561 *BioMag® Goat anti-Human IgM*
- TDS #562 *BioMag® Goat anti-Human IgG (Fc Specific)*
- TDS #563 *BioMag® Goat anti-Human IgG*
- TDS #569 *BioMag® SelectaPure mRNA Purification System*
- TDS #570 *BioMag® Carboxyl*

Magnetic Microparticles con't.

- TDS #580 *BioMag® SelectaPure anti-Human CD3*
- TDS #581 *BioMag® SelectaPure anti-Human CD4*
- TDS #583 *BioMag® SelectaPure anti-Human CD8*
- TDS #584 *BioMag® SelectaPure anti-Human CD14*
- TDS #585 *BioMag® SelectaPure anti-Human CD16*
- TDS #586 *BioMag® SelectaPure anti-Human CD19*
- TDS #587 *BioMag® SelectaPure anti-Human CD34*
- TDS #588 *BioMag® SelectaPure anti-Human CD45*
- TDS #589 *BioMag® SelectaPure anti-Human CD56*
- TDS #590 *BioMag® SelectaPure anti-Human CD71*
- TDS #591 *Cell Sorting Using BioMag® SelectaPure anti-Human Leukocyte Particles*
- TDS #592 *BioMag® SelectaPure anti-Mouse CD4*
- TDS #593 *BioMag® SelectaPure anti-Mouse CD8a*
- TDS #594 *BioMag® SelectaPure anti-Mouse CD45R*
- TDS #595 *BioMag® SelectaPure anti-Human CD2*
- TDS #596 *BioMag® SelectaPure anti-Human CD11b*
- TDS #597 *BioMag® SelectaPure Human T cell Enrichment System*
- TDS #617 *BioMag®Plus Amine & BioMag®Plus Amine Protein Coupling Kit*
- TDS #618 *BioMag®Plus Carboxyl & BioMag®Plus Carboxyl Protein Coupling Kit*
- TDS #619 *BioMag®Plus Goat anti-Mouse IgG Particle Antibody Coupling Starter Kit*
- TDS #620 *BioMag®Plus Protein A and G Particle Antibody Isolation Starter Kit*
- TDS #621 *BioMag®Plus Streptavidin & BioMag®Plus Streptavidin / Biotin Binding Starter Kit*
- TDS #658 *ProMax Albumin Removal Kit*
- TDS #659 *ProMax Serum IgG Removal Kit*
- TDS #692 *BioMag®Plus Mouse anti-Fluorescein IgG*
- TDS #721 *BioMag® Maxi Carboxyl*
- TDS #722 *BioMag® Maxi Amine*
- TDS #745 *ProMag™ HC High Capacity Magnetic Microspheres*
- TDS #755 *ProMag™ Magnetic Microspheres*
- TDS #759 *BioMag®Plus Wheat Germ Agglutinin*
- TDS #766 *BioMag®Plus Concanavalin A*
- TDS #855 *Magnetic Particles – ProMag™ and BioMag®*
- TDS #1003 *ProMag™ High Performance Magnetic Microspheres*

Magnetic Separators

- TDS #571 *BioMag® Flask Separator*
- TDS #572 *BioMag® 15ml / 50ml Tube Separator*
- TDS #573 *BioMag® 12mm x 75mm Test Tube Separator*
- TDS #574 *BioMag® Multi-32 Microcentrifuge Tube Separator*
- TDS #575 *BioMag® 96-Well Plate Separator*
- TDS #575A *BioMag® 96-Well Plate Side Pull Magnetic Separator*
- TDS #576 *BioMag® Multi-6 Microcentrifuge Tube Separator*
- TDS #577 *BioMag® Solo-Sep Microcentrifuge Tube Separator*
- TDS #791 *BioMag® MultiSep Magnetic Separator*
- TDS #796 *Biomagnetic Separators*

NIST Traceable Particle Size Standards

- TDS #623 *Precision Particles: NIST Traceable Size Standards*

Polymer Microspheres

- TDS #238 *Polybead® Polystyrene Microspheres: FAQ*
- TDS #238C *Covalent Coupling of Proteins to Carboxylated Polystyrene Microparticles by the "Carbodiimide" Method*
- TDS #238D *Covalent Coupling of Proteins to Amino & Blue Dyed Microspheres*
- TDS #238E *Protocol for Adsorbing Proteins on Polystyrene Microspheres*
- TDS #238G *Glutaraldehyde Kit for Amino & Blue Dyed Beads*
- TDS #404 *Polyballs*
- TDS #644 *PolyLink Protein Coupling Kit for COOH Microparticles*
- TDS #788 *Polybead® Microspheres*
- TDS #853 *PolyLink Protein Coupling Kit with Hollow Fiber Filtering System*
- TDS #854 *Glutaraldehyde Coupling Kit with Hollow Fiber Filtering System*
- TDS #856 *Polystyrene Beads, Large*

Protein Coated Microspheres

- TDS #615 *Protein Conjugated Microspheres*
- TDS #616 *Streptavidin & Biotin Conjugated Microspheres*

SNARe™ DNA Purification Systems

- TDS #710 *SNARe™ Whole Blood Genomic DNA Purification System*
- TDS #710A *SNARe™ Whole Blood Genomic DNA Purification 96-Well Microtiter Plate Protocol*
- TDS #711 *SNARe™ Plasmid DNA Purification System*
- TDS #712 *SNARe™ Plant Genomic DNA Purification System*

SureCount™ Particle Count Standards

- TDS #852 *SureCount™ Particle Count Standards*

Uniform Silica Microspheres

- TDS #635 *Uniform Silica Microspheres*
- TDS #792 *Silica Microspheres, Colloidal*

ViaCheck™ Viability Instrument Standards

- TDS #729 *ViaCheck™ 0% Viability Control*
- TDS #729 *ViaCheck™ 25% Viability Control*
- TDS #729 *ViaCheck™ 50% Viability Control*
- TDS #729 *ViaCheck™ 75% Viability Control*
- TDS #729 *ViaCheck™ 90% Viability Control*
- TDS #729 *ViaCheck™ 100% Viability Control*
- TDS #734 *ViaCheck™ Concentration Control (1 x 10^6)*
- TDS #734 *ViaCheck™ Concentration Control (4 x 10^6)*
- TDS #734 *ViaCheck™ Concentration Control (8 x 10^6)*

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Technical Information

At Polysciences, we are committed to making the finest microspheres in the world, and providing the highest level of customer and technical service from initial discussions through the product lifecycle and beyond. We hope that you find this catalog to be helpful as you consider products for your work, and invite you to contact us if we may address any questions or be of assistance in formulating solutions to meet your specific needs.

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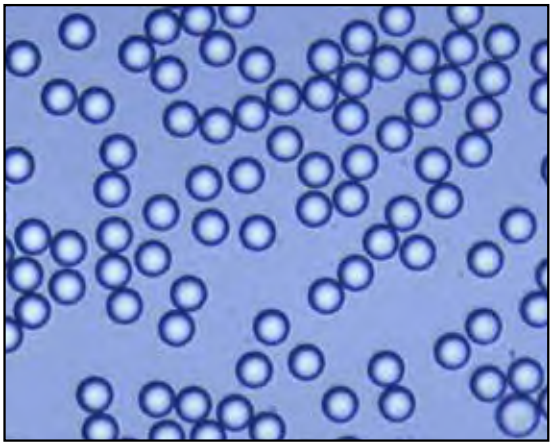


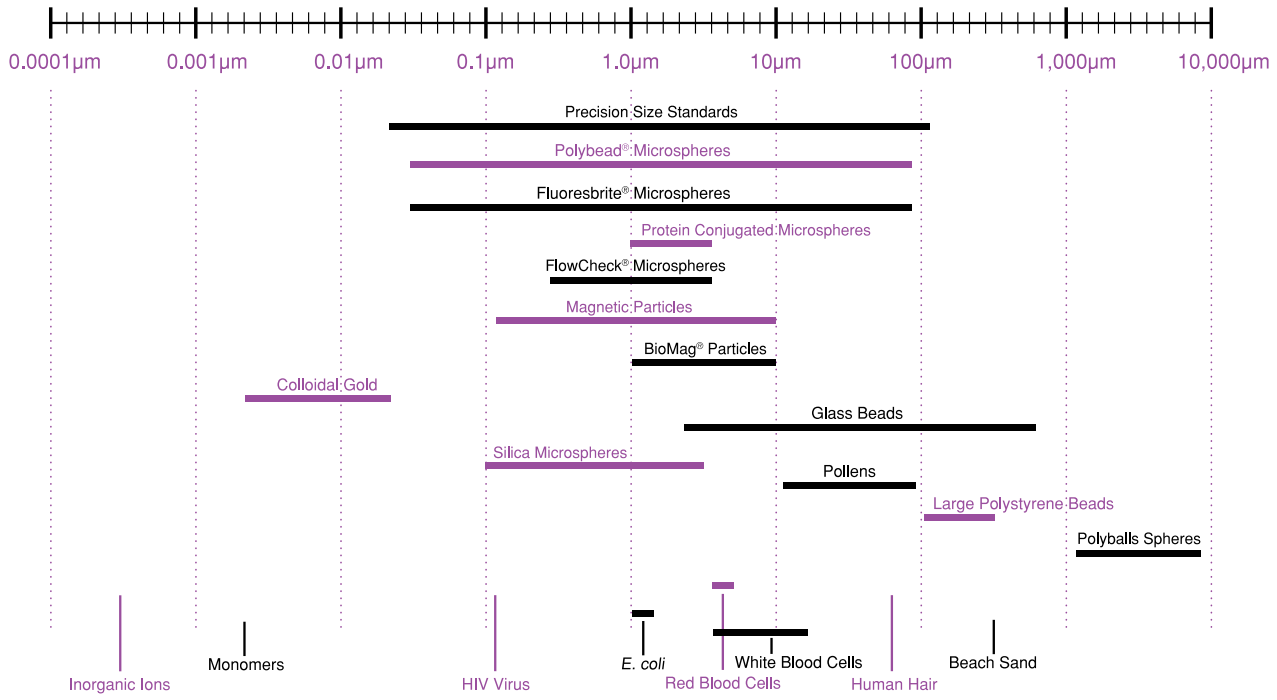
Well-dispersed 10µm Polybead® Microspheres

How Particles Measure Up

Precision Size Standards	0.04 - 175µm
Polybead® Microspheres	0.05 - 90µm
Fluoresbrite® Microspheres	0.05 - 90µm
Protein Conjugated Microspheres	1 - 6µm
Flow Check™ Microspheres	0.5 - 6.0µm
Magnetic Particles	0.2 - 10µm
BioMag® Particles	1.0 - 10µm
Colloidal Gold	0.005 - 0.06µm
Glass Beads	3 - 850µm
Silica Microspheres	0.1 - 5.0µm
Pollens	12 - 90µm
Large Polystyrene Beads	106 - 600µm
Polyballs	1,587.5 - 9,525µm
Inorganic Ions	0.0006µm
Monomers	0.0045µm
HIV virus	0.12µm
E. coli	1 - 2µm
Red Blood Cells	6 - 8µm
White Blood Cells	7 - 25µm
Human Hair	80µm
Beach Sand	650µm

How Polysciences' Microspheres and Other Particles Measure Up

1 Micron (µm) = 1,000 Nanometers = 10,000 Angstroms



Microsphere Selection

Microspheres offer a highly convenient and flexible system for developing reagents for assays and bioseparations and for use as instrument standards. As there are many varieties of microspheres available, it is important to think about the demands of the application when selecting a microsphere. Physical and optical properties should be considered in the context of handling and detection, and thought should also be given to requirements for diameter and size distribution, composition, surface chemistry and any other needed properties.

Property	Considerations
Size	Diameter, Uniformity / distribution
Composition	Density, Refractive index, Hydrophobicity / -philicity, Nonspecific binding, Autofluorescence
Surface chemistry	Reactive groups, Level of functionalization, Charge
Special properties	Visible dye / fluorophore, Superparamagnetic

Particle Size

Microsphere size may be critical to the proper function of an assay, or it may be secondary to other characteristics. Considering traditional diagnostic methods, the test or assay format commonly dictates particle size, such as the use of very small spheres (~0.1 - 0.4µm) to ensure satisfactory wicking in lateral flow tests, or the use of larger, cell-sized spheres (~4 - 10µm) for bead-based flow cytometric assays.

In magnetic separations, particularly those involving capture and elution of target, the exact size of the magnetic particle may be unimportant provided that the particles are in some general size range and offer desired separation characteristics.

Diameter also determines surface area. Small-diameter spheres present more surface area per unit mass, while larger spheres present more surface area per bead. Size also effects ease of handling, process considerations (such as the method used for separations [centrifugation, dialysis, filtration]) and the amount of reagent needed for coating.

All sizes listed in this catalog are nominal. For most products, the mean diameter of your particles will be printed on the label with the standard deviation.

Particle Composition

Common microsphere compositions include polystyrene (PS), poly(methyl methacrylate) (PMMA) and silica. These materials possess different physical and optical properties, which may present advantages or limitations for different applications.

Polymer beads are generally hydrophobic, and as such, have high protein binding abilities. However, they often require the use of some surfactant (e.g. 0.01 - 0.1% Tween® 20 or SDS) in the storage buffer to ensure ease of handling. During synthesis, functional monomers may be co-polymerized with styrene or methyl methacrylate to develop beads with reactive surface groups. Functional groups may be used in covalent binding reactions and also aid in stabilizing the suspension.

Silica microspheres are inherently hydrophilic and negatively-charged. Consequently, aqueous silica suspensions rarely require the use of surfactants or other colloidal stabilizers. Carboxyl- and amine-functionalized silica spheres are available for use in common covalent coating protocols, and plain silica microspheres may be modified using a variety of silanes to generate functional groups or alter surface properties.

Composition	Refractive Index (589nm)	Density (g/cm^3)	Glass Transition Temperature (˚C)
PS	1.59	1.05	95
PMMA	1.49	1.19	105
Silica	1.43 - 1.46*	2.0*	>>1000

**Determined using representative samples. Other values are as reported in the literature for bulk polymer or silica.*

Common Test and Assay Formats

Test / Assay Format	Bead Size	Bead Type	Coating Strategy	Detection Strategy
Flow cytometric (suspension array)	2 - 15µm	QuantumPlex™, QuantumPlex™M (encoded populations for multiplexing), Non-fluorescent (simplex or multiplex with different bead sizes)	Covalent, Streptavidin / biotin	Flow cytometer
Lateral Flow	0.1 - 0.4µm	Dyed (visible or fluorescent)	Covalent, Adsorption	Visual or automated reader (absorbance, fluorescence), Visual
Lateral Flow - Boulders in the Stream	0.1 - 0.4µm mobile phase, ~2 - 3µm capture phase	Dyed (visible) mobile phase, Undyed capture beads	Covalent, Adsorption	Visual
Dipstick	0.1 - 0.4µm	Dyed (visible)	Covalent, Adsorption	Visual
Latex Agglutination Tests (LATs)	0.2 - 1.0µm	Undyed, Visibly dyed	Covalent, Adsorption	Visual (may be microscope-assisted)
Turbidimetric (Automated LAT)	50nm - 500nm	Undyed	Covalent	Turbidimetry

Magnetic Assays

Assays	Suggested Products
Immunoassays	ProMag™, ProMag™ HP, ProMag™ HC or BioMag®
Hybridization-based assays	ProMag™ and ProMag™ HC

Magnetic Separations

Magnetic Separations	Suggested Products
Cells	BioMag® anti-CD marker or secondary antibody
Subcellular organelles	BioMag®
Immunoprecipitates	BioMag® secondary antibody
mRNA	BioMag® Oligo dT(20) or mRNA Purification System
Biotinylated oligonucleotide capture or binding	ProMag™ or BioMag® Streptavidin
Biopanning	ProMag™ or BioMag®
Glycoproteins	BioMag® Wheat Germ Agglutinin or BioMag® Concanavalin A

Special Properties

Many applications in the life sciences demand added properties such as fluorescence or a visible color, or iron oxide inclusions for magnetic separations. Polymer spheres (and some polymer-based magnetic spheres) are often internally dyed via organic solvent swelling and many standard products are available. Dye concentrations can be adjusted to produce beads with different intensities to meet special needs, such as QuantumPlex™ for multiplexed flow cytometric assays or our Dragon Green or Flash Red Intensity Standards, which support imaging applications and associated instrument QC. Many surface- or internally-labeled fluorescent beads are also available as specialized flow cytometry standards.

Various types of superparamagnetic microparticles are available, with different matrices, magnetite content, surface groups, etc. For new assays or applications, magnetic beads should be evaluated with application demands in mind.

General Handling

Particle Suspension

The number of particles per ml will vary with the specified weight to volume (w / v) concentration, diameter of the particle and density of particle composition. The number of particles per milliliter can be calculated using the following equation:

$$\frac{6x \bullet 10^{12} \bullet \rho_L}{\rho_S \bullet \pi \bullet z^3}$$

x = solids content (g/ml)
ρ_S = density of solid sphere (g/cm^3)
z = diameter (µm)
ρ_L = density of bead suspension (g/ml)
$\rho_L = 100 \bullet \rho_S / [100 \times (1 - \rho_S) + (100 \bullet \rho_S)]$

The following grid gives the estimated particles per milliliter for common diameters of polystyrene beads (ρ = 1.05 g/ml) suspended at 2.5% solids (w / v) and silica beads (ρ = 2.0 g/ml) suspended at 10% solids, at common diameters:

Diameter (µm)	Polystyrene 2.5% Solids (particles/ml)	Silica 10% Solids (particles/ml)
0.05	3.64×10^{14}	N/A
0.10	4.55×10^{13}	1.00×10^{13}
0.20	5.68×10^{13}	1.26×10^{13}
0.35	1.06×10^{12}	2.34×10^{12}
0.50	3.64×10^{11}	8.04×10^{11}
0.75	1.08×10^{11}	2.38×10^{11}
1.00	4.55×10^{10}	1.00×10^{10}
1.50	1.35×10^{10}	2.98×10^{10}
2.00	5.68×10^{9}	1.26×10^{10}
3.00	1.68×10^{9}	3.72×10^{9}

Diameter (µm)	Polystyrene 2.5% Solids (particles/ml)	Silica 10% Solids (particles/ml)
4.50	4.99×10^{8}	1.10×10^{9}
6.00	2.10×10^{8}	4.65×10^{8}
10.0	4.55×10^{7}	N/A
15.0	1.35×10^{7}	N/A
20.0	5.68×10^{6}	N/A
25.0	2.91×10^{6}	N/A
45.0	4.99×10^{5}	N/A
75.0	1.08×10^{5}	N/A
90.0	6.24×10^{4}	N/A

Surface to Volume Ratios

Use these formulas as a rough guide to estimate the surface area or the volume of a sphere. Determination of the surface area of polystyrene spheres is complicated by the unique form of the polymer. These beads are made by the formation of many single chain polymers which may be likened to a ball of wool. Thus, the surface area may be much greater than that predicted by the simple formula. This is particularly important for protein binding applications and charge calculations.

Surface Area = $4 \pi r^2$

Volume = $4 / 3 \pi r^3$

Handling and Storage

Our microspheres are synthesized in water and should be stored in aqueous environments. Deionized water is the best suspending medium for uncoated spheres as high concentrations of ions may result in aggregation. Coated microspheres should be stored in buffers that are appropriate for the ligand that is bound to the surface. Storage of particles over long periods of time should be at 4°C to deter the growth of microbes, and the particle suspensions must not be allowed to freeze. Dyed and fluorescent particles should be protected from light. Biocides may be added for extended storage.

Washing

Microspheres sold as instrument standards can often be used as-is, or simply diluted in an appropriate buffer or aqueous solution. Conversely, microspheres that will be coated or otherwise modified should be washed to remove additives and residuals that could interfere with the binding reactions or other processes.

Common washing and separation methods for non-magnetic beads include centrifugation, filtration and dialysis. Selection of the "best" method will depend on scale, required throughput and microsphere characteristics. Centrifugation is often used for small-scale separations of ≥0.5µm, dialysis for spheres <0.5µm and filtration for small spheres <0.5µm, or to achieve higher throughput. Superparamagnetic microparticles are separated using rare earth or electro-magnets.

Centrifugation

Particle washing may be conducted via centrifugation. This procedure must be performed carefully as excessive centrifugation may result in resuspension difficulties. Though centrifugation of BioMag® magnetic particles is not recommended, ProMag™ may be processed in this way. For the purposes of pelleting, it is important to understand the settling velocities of particles. For spherical particles, settling velocity can be calculated using Stokes' Law:

$$V = \frac{2Ga^2(\rho_1 - \rho_2)}{9n}$$

V = Velocity (cm/sec)
G = G force (1G = 980.7 cm/sec^2)
ρ_1 = density of particle (g/cm^3)
ρ_2 = density of suspending media (g/cm^3)
n = coefficient of viscosity (poise; g/cm-sec)
a = radius of spherical particle in cm

For calculating the settling velocity of polystyrene spheres at 1 G in 20°C water, Stokes' Law can be expressed in the following formula where d = diameter (µm) (ρ_1 = 1.05 g/cm^3, ρ_2 = 1.00 g/cm^3 and n = 1.002 cp); V= 2.77 x 10^{-6} d^2. To estimate appropriate times for centrifugation, settling velocity is multiplied by the G forces generated by the centrifuge. The resultant velocity is then compared to the height of the centrifuge tube.

For example:
A 1.0µm polystyrene particle placed in a microcentrifuge generating 10,000 G will settle at a velocity of 2.72 x 10^{-2} cm/sec.

Pelleting the particle in a 4cm high tube would require a 144 second (minimum) centrifuge run. The actual time required to form an acceptable pellet could possibly be 50% longer. These calculations are intended to be used as guidelines to assist in determining centrifugation time. Different size particles yield dramatically different settling velocities. A 10.0µm particle could settle in 2 seconds under the aforementioned conditions, whereas a 0.01µm particle could take at least 4 hours to settle. Brownian motion and particle concentration also affect the settling rate.

Aggregation

Our microspheres are available in a variety of compositions, including polystyrene, poly(methyl methacrylate), and silica. Though polymer microspheres are more susceptible to hydrophobic-mediated aggregation, there are several factors that may influence the dispersity of the suspension. For example, low surface charge, small diameter (high surface area : volume ratio), high microsphere concentration and suboptimal buffer composition or pH may promote aggregation. Strategies that are effective in addressing aggregation thus counter these conditions, i.e. use of surfactant to reduce hydrophobicity (e.g. 0.01 - 0.1% Tween® 20 or SDS), sonication to disrupt aggregates and adjusting microsphere concentration or buffer pH to deter contact between individual spheres.

Coating Microspheres

General Information

Microspheres may be coated with capture molecules such as antibodies, oligonucleotides, peptides, etc. for use in diagnostic or separation applications. Microsphere coatings are typically optimized to achieve desired specific activity, while minimizing nonspecific interactions. Consideration should also be given to the required stability, development time frame and budget and the specific biomolecule to be coated. These factors will aid in determining the most fitting coating strategy for both short- and long-term objectives.

Standard microsphere products support three basic coating strategies: passive adsorption, covalent coupling and affinity binding. It is important to note that each binding strategy has benefits and limitations, which should be weighed in the context of study objectives and the demands that will be placed upon the finished reagent.

Passive Adsorption

Passive adsorption relies primarily on hydrophobic interactions between the biomolecule and the polymer particle. Such coatings are fairly simple to conduct, involving incubation of the microspheres with the purified ligand. They typically require little optimization and reagents may be developed relatively quickly. However, as adsorption relies on the formation of multiple attachment points between the molecule and the particle, this strategy is typically reserved for use with proteins and non-functionalized polymer spheres. Adsorption is generally not suitable for hormones, peptides or nucleic acids in hybridization-based applications, and protein adsorption to silica is expected to be less efficient than to polymer. Most techniques using passive adsorption technology report four to six months of bead stability. The reagent may be lyophilized for extended stability.

Covalent Coupling

Covalent coupling results in the permanent attachment of the molecule to the functionalized (e.g. carboxyl or amine) microsphere. It can provide needed stability when developing a commercial reagent, and for multiplexed assays, where analyte-specific bead populations are mixed. Additionally, specialized chemical linkers may be employed to address steric effects or to optimally orient the molecule. If surfactant is required as an additive in the assay, covalent coupling procedures are recommended as surfactants can displace adsorbed proteins from the surface. Covalent binding is also important for the immobilization of oligonucleotides or peptides, where end-point attachment is required. Although covalent binding protocols often involve a higher level of optimization than other approaches, coupling kits are available to simplify the process.

When Coupling to Particles Less Than 0.5µm

The chemical aspects of the protocols are universally applied, but the mechanical separations of these particles must be adapted for specific sizes. Most protocols suggest centrifugation to separate the particles from the reagents. This is not practical for particle sizes less than 0.5µm, as most microcentrifuges cannot spin these particles down within 30 minutes. Even extremely high G forces are not recommended, as resuspension becomes arduous. Other separation techniques may be utilized, such as dialysis, forced membrane filtration or centrifugal filter devices. Polysciences also offers coupling kits that use hollow fiber filtration techniques in addition to Vivaspin® Ultrafiltration devices to effect separation of 0.1-0.5µm particles.

Affinity Binding

Affinity binding is a straightforward method for immobilizing primary antibodies or tagged molecules. Proteins A and G and Fc-specific antibody coatings permit the directed immobilization of primary antibodies, and streptavidin (SA) is used extensively for the binding of biotinylated molecules, such as antibodies, peptides and oligonucleotides.

Biomolecule	Coating Strategy	Notes
Peptides	Covalent Streptavidin / biotin	End-point attachment to preserve the activity of the peptides.
Nucleic acids	Covalent Streptavidin / biotin	End-point attachment to permit hybridization of probe sequence with target sequence.
Proteins (e.g. antibodies)	Covalent Adsorption Streptavidin / biotin Proteins A / G	Common proteins are generally large enough that multi-point attachment and nonspecific orientation do not compromise their activity. However, linkers, spacers (covalent or SA / B) or affinity ligands may be employed to address steric effects or sub-optimal orientation.

Alternative for BSA as a Blocking Agent

Any innocuous protein may be used to block the effects of non-specific adsorption. In selecting an alternative to BSA, it is suggested that the size of the active protein and the size of the blocking protein be compared. BSA is highly recommended for IgG coupling. However, the large size of BSA could obscure the activity of smaller active proteins. Glycine or small polypeptides may be used as alternatives.

Protein Coupling Efficiency Determination

Coupling efficiency can be determined by measuring the change in absorbance of the supernatant before and after coupling.

1. Set spectrophotometer wavelength to 280nm. Blank with the Coupling Buffer.
2. Measure the absorbance of the Pre-Coupling Solution. A further dilution may be necessary to read an absorbance depending upon the amount of protein added (D = dilution factor).
3. Measure the absorbance of the Post-Coupling Solution. A dilution may be necessary to read the absorbance (D = dilution factor).
4. Calculate the coupling efficiency, expressed as the % Protein Uptake, as follows. Typical values of Protein Uptake are >60%.

$$\left[\frac{(A_{280}\ \text{Pre-Coupling Solution}_1 \times D) - (A_{280}\ \text{Post-Coupling Solution}_2 \times D)}{(A_{280}\ \text{Pre-Coupling Solution}_1 \times D)} \times 100 \right]$$

Protein Binding Protocols

The following sequences serve as guidelines for protein binding. Technical Data Sheets (TDS) with detailed step-by-step protocols can be downloaded from our website, and ligand-specific immobilization protocols may be found in the literature.

Adsorbing Protein on Particles TDS #238E	Coupling by Carbodiimide TDS #238C & #644	Coupling by Glutaraldehyde TDS #238D & #238G
Plain Polystyrene	**Carboxylate Functional Particles**	**Amino or Blue Dyed Particles**
• Initial Buffer: 0.1M Borate Buffer, pH 8.5	• Initial Buffer: 0.1M Carbonate Buffer	• Initial Buffer: 0.02M PBS, pH 7.4
• Suspend in buffer, spin down and resuspend 2 or 3 times.	• Suspend in buffer, spin down and resuspend 2 or 3 times.	• Suspend in buffer, spin down and resuspend 2 or 3 times.
• Suspend in borate buffer.	• Suspend in MES buffer.	• Suspend in PBS.
• Add protein and mix end-to-end overnight.	• Add fresh carbodiimide solution dropwise and incubate for 15 - 30 minutes.	• Suspend in 8% glutaraldehyde in PBS, pH 7.4 and mix end-to-end for 4 - 6 hours.
• Spin and save supernatant for protein determination.	• Wash to remove excess carbodiimide, then resuspend in borate buffer.	• Wash to remove excess glutaraldehyde and resuspend in PBS buffer.
• Re-suspend in BSA in appropriate buffer and spin down twice.	• Add protein and mix end-to-end for 2 - 4 hours.	• Add protein and mix end-to-end overnight.
• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).	• Add ethanolamine, mix for 30 minutes.	• Add ethanolamine, mix for 30 minutes.
• Protein bound directly on surface.	• Spin and save supernatant for protein determination.	• Spin and save supernatant for protein determination.
	• Re-suspend in BSA-containing buffer and spin down twice.	• Re-suspend in BSA-containing buffer and spin down twice
	• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).	• Re-suspend in PBS, pH 7.4, containing BSA (storage buffer).
	• Protein bound 2 - 3 carbon atoms from surface.	• Protein bound 5 carbon atoms from surface of blue dyed beads and 11-12 carbon atoms from surface of amino beads.

Protein Coupling Troubleshooting

Below are some solutions for protein coupling troubleshooting. If you do not see a solution to the problem you have encountered, please email us at **info@polysciences.com**.

Problem	Solution
Clumping prior to use	Careful sonication
Clumping after procedure • Carbodiimide addition causes clumping • Glutaraldehyde addition causes clumping • Protein addition causes clumping • Washing causes clumping	Isolate the step that causes clumping • Add slowly, agitate beads, decrease bead concentration • Add slowly, agitate beads, decrease bead concentration; add an excess of glutaraldehyde to avoid chemical crosslinking of particles; clumping will typically resolve by the conclusion of protein coupling • Increase protein concentration • Add surfactant or reduce number of washing steps
Low binding	Move pH closer to protein isoelectric point
Variable coating	Use pure water – no contaminants; use fresh reagents
Coating, but no reaction	Optimize pH away from isoelectric point
Centrifuge not practical	Use membrane filtration, dialysis, or spin filters for small particles
Nonspecific adsorption	Use an alternative for BSA (glycine, casein)
Small proteins bound, but not reactive	Use a crosslinking reagent to extend coupling away from the surface of the bead
Long-term storage leaches protein	Try covalent attachment or lyophilize final product

Polystyrene Microspheres

Polystyrene Microsphere General Characteristics

Parameter	Description
Size	0.05 - 150µm for a wide range of applications
Monodispersity	Coefficient of variance ≤15% for most size ranges, 0.05 - 90µm
Concentration	2.5%
Suspending medium	DI water with residual surfactant to ensure stable dispersions
Color	Undyed, red, yellow, black, blue, violet, orange, green and several fluorescent colors
Functionality	Plain, COOH, $-NH_2$ and -OH.
Stability	Inert, safe for handling and ideal for biological studies
Protein Affinity	Covalent coupling for functionalized spheres or passive adsorption possible
Glass Transition	~94˚C, stable to moderate heating temperature; some diameters feature a low level of DVB crosslinking
Bead Density	~1.05 g/cm^3, similar to cell densities
Refractive Index (589nm)	~1.59 - 1.60, ideally suited for applications
Biocides	None (except where noted); particles are compatible with azide, ProClin® and other treatments.

Polystyrene Microsphere Stability

Polysciences offers a one year shelf life for most products. Unless noted, biocides are not added and the particles are shipped in DI water with residual surfactant. All polystyrene products should be stored at 4˚C to prevent microbial growth. Microsphere suspensions must be protected from freezing to safeguard against irreversible aggregation. If long-term storage is required, the addition of biocide is recommended.

Polystyrene Microsphere Monodispersity

The following chart lists our specifications for the uniformity of our particles, expressed as the coefficient of variance (CV). The actual diameter (D) and the standard deviation (SD) for each lot is printed on the label. The % CV is expressed as the SD / D x 100.

Diameter (µm)	CV Maximum (%)
0.05	≤15
0.10	≤15
0.20	≤8
0.35	≤5
0.50	≤3

Diameter (µm)	CV Maximum (%)
0.75	≤3
1.00	≤3
1.5	≤5
2.00	≤5
3.00	≤5

Diameter (µm)	CV Maximum (%)
4.50	≤7
6.00	≤10
10.00	≤10
15.00 - 90.00	≤15

Polystyrene Microsphere Sterility and Shelf Life

Our polystyrene microspheres are packaged as non-sterile suspensions. We have made the decision to give the customer the option of adding biocides or preservatives into the product upon receipt. The particles will be stable for up to one year after the date of sale. Degradation of the particles, their functional groups or the incorporated dyes is not expected under normal conditions and our primary concern is the quality of the DI water. We make every effort to ensure that our water source and packaging procedures will allow us to meet our one year shelf life. If a sterile product is necessary, then the particles may be gamma irradiated. Additions of biocides, such as thimerosol or sodium azide, are common. For research applications involving *in vivo* studies or live cells, the particles can be suspended in alcohols prior to use. See Technical Data Sheet #670, *Decontaminating Microspheres,* for more information.

Embedding Tissues Containing Polystyrene Microspheres

Polystyrene microspheres have been visualized by light microscopy in unembedded coverslip monolayers, in fixed or unfixed frozen sections, in paraffin sections and in glycol methacrylate kits. For paraffin sections, n-butyl alcohol must be used for clearing and deparaffination since typical organic solvents (e.g. toluene, THF, or ethyl acetate) will destroy the beads. The beads cannot be embedded in methyl or butyl methacrylate media. TEM embedments in Epon and Spurrs have been successful.

Polybead® and Fluoresbrite® Dyed Particles

Types of Dyes Used

Our Fluoresbrite®, Polybead® and some Flow Check™ product feature water insoluble dyes*. This minimizes the incidence of dye leaching from the particles into aqueous buffers. Our visibly dyed microspheres are available as black, blue, red, violet, orange, green and yellow. Other colors and intensities are available on a custom basis. Many of the Bangs Flow Cytometry Standards are "surface dyed" with the same fluorochromes used for making antibody conjugates. Polysciences can custom manufacture Fluoresbrite® particles with a customer's dye of choice. Polysciences' most popular fluorescent dyes match the following filter settings:

Fluorescent Particles	Filter Setting	Dyed Particle	Excitation Max. (nm)	Emission Max. (nm)
BB (Bright Blue)	Coumarin	BB	360	407
YG (Yellow Green)	Fluorescein	YG	441	486
YO (Yellow Orange)*	Rhodamine	YO	529	546
PC (Polychromatic Red)	Phycoerythrin	PC	491; 512	554
		Ruby Red	475; 590	663
		FITC	492	512
		R-PE	480; 565	578
		Sulforhodamine	540	645
		APC	650	660

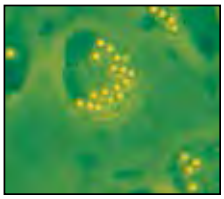
** YO has limited water solubility; some leaching may occur with rigorous washing.*

Dyed Microspheres and Microscopy

A 6µm visibly dyed (non-fluorescent) particle is the smallest particle whose color can reasonably be observed under light microscopy conditions (400x). Infinite magnification of a dyed particle will result in an undyed appearance. Fluorescently-labeled Fluoresbrite® microspheres are recommended for microscopic viewing of particles smaller than 6µm. Fluoresbrite® 0.05µm particles have been identified using a fluorescent microscope set at 100x objective and 10x ocular magnification.

Fluoresbrite® for Phagocytosis or Retrograde Transport

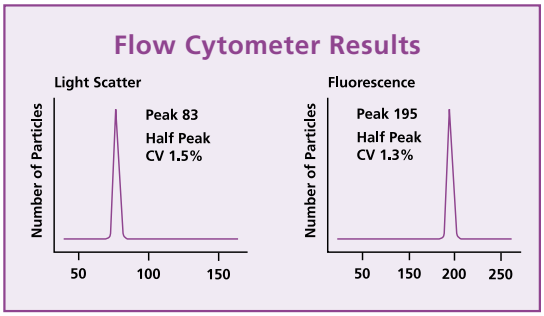
Uniform polystyrene particles are ideal for cellular studies. Microspheres are easily identified by their intense fluorescence, and polystyrene has long been recognized as a biologically active surface for cell attachment. See *Technical Data Sheet #430* for more information on phagocytosis studies.



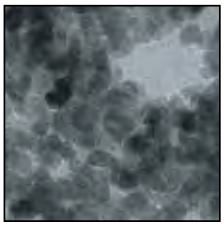
Fluoresbrite® to Calibrate Flow Cytometers

Our Fluoresbrite® Calibration Grade particles have had a long history of use as flow cytometry standards. We also carry the extensive line of Bangs Flow Cytometry Standards. See *Technical Data Sheet #431* for more information.

Data for the chart to the right was obtained on a EPICS V instrument with fluorescent polystyrene beads, 2µm in diameter. Data courtesy of Kristi Harkins, University of Nebraska / Lincoln.



BioMag®, BioMag®Plus and BioMag® Maxi



BioMag® Physical Characteristics

Our conventional BioMag® are irregularly-shaped iron oxide particles that are approximately 1-2µm in size. BioMag®Plus are similar, but have undergone additional processing for the reduction of outliers. BioMag® Maxi are ~6µm. Functionalized versions are covered with a silane coating that provides functional groups for the attachment of proteins or antibodies. The irregular shape of the BioMag®, BioMag®Plus and BioMag® Maxi particles provide increased surface area and therefore increased binding capacity per unit mass.

BioMag® particle surface area:	>100 m^2/g
BioMag® particle density:	>>2.5 g/cc
BioMag® settling rate:	4% in 30 minutes

BioMag® Stability

As the BioMag® base particle is composed of coated iron oxide, the particle itself is very stable. However, any proteins or antibodies attached to BioMag® particles are susceptible to degradation over time. BioMag® should not be frozen or exposed to elevated temperatures.

BioMag® Stability in Solvents

BioMag® particles have been used in various coupling buffers at pH ranging from 5.5 to 8.0. Low pH buffers can be problematic for BioMag®. It is best to test BioMag® in advance of exposure to organic solvents or extreme pH conditions.

BioMag® Magnetic Responsiveness

BioMag® particles are superparamagnetic. In other words, they have no magnetic memory and will readily re-suspend if the magnetic force is removed. The particles are greater than 90% magnetite in composition and have a magnetization of 25 - 35 emu/g (Electromagnetic Units).

Positive and Negative Selection with BioMag®

BioMag® particles can be used for both positive and negative selections. In negative selection, the unwanted components are bound and pulled out of solution by the BioMag® particles. After magnetic separation, the resulting supernatant is enriched for the target cells or molecules. In positive selection schemes, the BioMag® particles are used to pull out of solution only the target cells or molecules of interest. Unwanted cell populations and other sample constituents will be discarded with the supernatant, resulting in a purified suspension of the target components.

Magnetic Separator for BioMag®

Small superparamagnetic particles such as BioMag® require a strong magnetic field for efficient separation. Polysciences' magnets offer optimal performance, featuring rare earth (Neodymium-Iron-Boron) magnets embedded in plastic housings, with magnetic strengths ranging from 27 - 35 megagauss Oersteds. See *Technical Data Sheet #796* for additional information on the magnetic separators offered.

For complete technical information for each BioMag® product, refer to the appropriate Technical Data Sheet.

Flow Cytometry Quality Control

Validation / Quality Control

An instrument validation / Quality Control (QC) program will depend on the type and complexity of the work being performed on the instrument. A multi-fluorescent bead such as Full Spectrum™ allows operators to run a single product to check basic function and track general stability of all of the lasers / detectors. It will also be important to understand the sensitivity, resolution and linearity of different detectors. Linearity determinations are particularly important for quantitative fluorescence analyses.

Instrument Set-Up

Flow cytometers are highly configurable, and results can vary dramatically with different instrument settings. Establishing a common "Window of Analysis" for each detector with the upper and lower fluorescence limits defined, allows reference populations to be positioned in approximately the same place on the same scale. This may be accomplished with the aid of Quantum™ QC or Full Spectrum™. If multi-color analyses are being performed, compensation standards will likely be required to tailor settings.

Applications

There are many different types of studies that can be conducted on a flow cytometer. This might include quantitative surface marker expression analysis (Quantum™ MESF, Quantum™ Simply Cellular®), absolute counting (Flow Cytometry Absolute Count Standard™), size estimation (Small Bead Calibration Kits, Size Calibration Standard Kits), or various fluorescence analysis (Fluorescence Reference Standards). For product-specific information, please see pages 348 - 362.

The chart that follows provides additional product recommendations for specific tasks / objectives, and we additionally invite you to contact us to discuss the specific requirements of your program.

Quantum™ APC MESF Kit

Category	Purpose	Frequency	Products
Daily QC	General check of instrument stability / status	Daily	Full Spectrum™ (multi) Ultra Rainbow Fluorescent Particles (multi) Fluorescence Reference Standards (single) Flow Check™ Ruby Red Fluorescent Microspheres (single) Quantum™ QC
Daily QC	General check of instrument optical system	Daily	Full Spectrum™ (multi) Ultra Rainbow Fluorescent Particles (multi) Fluorescence Reference Standards (single) Flow Check™ Ruby Red Fluorescent Microspheres (single) Quantum™ QC
Daily QC	Optical alignment	Daily	Right Reference Standard™ Flow Check™ Alignment and Compensation Particle Sets
Daily QC	Fluidics check	Daily	Surface-labeled fluorescent microspheres, e.g. Fluorescence Reference Standards, Quantum™ MESF
Weekly QC	Optical system sensitivity, resolution for linearity (for specific lasers / PMTs)	Weekly	Quantum™ QC
Daily Set-Up	Standardized instrument set-up (PMTs)	Daily or between runs if settings are changed	Quantum™ QC
Daily Set-Up	Standardized compensation settings for multi-color analyses	Daily or between runs if settings are changed	FITC/PE Compensation Standard Simply Cellular® Compensation Standard, Quantum™ Simply Cellular® Viability Dye Compensation Standard Simply Cellular for Violet Laser
Application	Fluorescence quantitation in cellular expression studies or bead-based assays	Daily when quantitative analyses are performed or between different applications, if fluorescence PMT settings are changed	Quantum™ MESF Quantum™ Simply Cellular®
Application	F:P ratio determination for quantitative fluorescence analyses	As needed, i.e. with each new lot of fluorochrome-conjugated antibody	Simply Cellular® (used in conjunction with Quantum™ MESF)
Application	Compensation for multi-color flow cytometry	Daily or between different applications if fluorescence PMT settings are changed	FITC / PE Compensation Standard Simply Cellular® Compensation Standard Quantum™ Simply Cellular® Viability Dye Compensation Standard Simply Cellular ® for Violet Laser, Fluorescence Reference Standards (single) Flow Cytometry Antibody Binding Beads (Protein A and G)
Application	Cell counting	As needed	Flow Cytometry Absolute Count Standard™
Application	Cell size estimation	As needed	Size Calibration Standards Kit Submicron Bead Calibration Kit Micron Bead Calibration Kit
Application	Suspension array	Platform for development of bead-based flow cytometric assays	QuantumPlex™ QuantumPlex™M

Technical Data Sheets

Accessory Reagents

- TDS #606 *MicroKros Hollow Fiber Filter*
- TDS #793 *Polysciences Bead Solution*
- TDS #794 *Polysciences Bead Coupling and Storage Buffers*
- TDS #911 *Accessory Reagents*
- TDS #912 *Surfactants*

Additional Microparticles

- TDS #281 *Sporopollenin Microparticles*
- TDS #604 *Iron Powder*
- TDS #605 *Black Iron Oxide Particles*
- TDS #607 *Red Iron Oxide Particles*
- TDS #744 *Hollow Glass Beads*
- TDS #758 *Glass Beads*
- TDS #783 *Phenolic Beads, Hollow*
- TDS #784 *Polybead® Hollow Microspheres*
- TDS #857 *Glass Beads*
- TDS #858 *PLGA Uniform Dry Microspheres*

Dyed Microspheres

- TDS #808 *Polybead® Dyed Microspheres*

Flow Cytometry Products

- TDS #508 *FlowCheck™ Microspheres*
- TDS #613 *FlowCheck™: Flow Cytometry Particles and Sets*
- TDS #624 *FlowCheck™ Ruby Red Fluorescent Microspheres*
- TDS #914 *Flow Cytometry Instrument Quality Assurance / Quality Control Program*
- TDS #916 *Small Bead Calibration Kits*
- TDS #PDS 214 *QuantumPlex™ SP Streptavidin*
- TDS #PDS 215 *QuantumPlex™ Streptavidin*
- TDS #PDS 234 *QuantumPlex™ SP Carboxyl*
- TDS #PDS 235 *QuantumPlex™ Carboxyl*
- TDS #PDS 250 *QuantumPlex™M Carboxyl*
- TDS #PDS 251 *QuantumPlex™M SP Carboxyl*
- TDS #PDS 252 *QuantumPlex™M Streptavidin*
- TDS #PDS 253 *QuantumPlex™M SP Streptavidin*
- TDS #PDS 510 *Right Reference Standard™*
- TDS #PDS 612 *Ultra Rainbow Fluorescent Particles*
- TDS #PDS 704 *Fluorescence Intensity Standards*
- TDS #PDS 725 *Quantum™ QC*
- TDS #PDS 810 *Simply Cellular® anti-Mouse IgG*
- TDS #PDS 812 *Simply Cellular® anti-Human IgG*
- TDS #PDS 813 *Simply Cellular® anti-Rat IgG*
- TDS #PDS 814 *Quantum™ Simply Cellular®*
- TDS #PDS 820 *FITC / PE Compensation Standard*
- TDS #PDS 821 *Quantum™ MESF Kits*
- TDS #PDS 829 *Size Calibration Standards Kit*
- TDS #PDS 831 *Time Delay Calibration Standard*
- TDS #PDS 835 *Simply Cellular® anti-Mouse for Violet Laser*
- TDS #PDS 850 *Simply Cellular® anti-Mouse Compensation Standard*
- TDS #PDS 851 *Simply Cellular® anti-Rat Compensation Standard*
- TDS #PDS 852 *Simply Cellular® anti-Human Compensation Standard*

Flow Cytometry Products con't.

- TDS #PDS 853 *Viability Dye Compensation Standard*
- TDS #PDS 854 *Flow Cytometry Protein A and Protein G Antibody Binding Beads*
- TDS #PDS 880 *Flow Cytometry Absolute Count Standard™*
- TDS #PDS 885 *Full Spectrum™*
- TDS #PDS 890 *Fluorescence Reference Standards*
- TDS #PDS 892 *Alexa Fluor® Reference Standards*
- TDS #917 *Quantitative Cytometry*
- TDS #PDS 818 *Quantum™ Simply Cellular® and Quantum™ MESF Tips and Techniques*
- TDS #PDS 819 *QuickCal®, v 2.3 Data Analysis Program*

Fluorescent Microspheres

- TDS #431 *Fluoresbrite® Microparticles – Frequently Asked Questions*
- TDS #745 *Microsphere Excitation and Emission Spectra*
- TDS #913 *StarLight™ Calibration Slides*
- TDS #915 *Fluoresbrite® Europium Chelate Microspheres*

Informational Data Sheets

- TDS #410 *Microsphere Coating Reagents*
- TDS #430 *Phagocytosis and Microparticles*
- TDS #670 *Decontaminating Microspheres*
- TDS #753 *Streptavidin-Coated Microspheres Binding Biotinylated DNA*
- TDS #788 *Microsphere Selection*

Magnetic Microparticles

- TDS #438 *Magnetic Microparticles*
- TDS #528 *BioMag® and Cell Sorting*
- TDS #528A *BioMag® and Cell Sorting References*
- TDS #529 *BioMag® Oligo (dT) 20*
- TDS #530 *BioMag® Nuclease-free Streptavidin*
- TDS #531 *BioMag® Coupling Procedures for Attaching Oligonucleotides*
- TDS #546 *BioMag® Magnetic Immobilization Kit & BioMag® Amine*
- TDS #547 *BioMag® Superparamagnetic Iron Oxide*
- TDS #548 *BioMag® Goat anti-Rat IgG (Fc Specific)*
- TDS #549 *BioMag® Goat anti-Mouse IgG*
- TDS #550 *BioMag® Goat anti-Mouse IgG (Fc Specific)*
- TDS #551 *BioMag® Streptavidin*
- TDS #552 *BioMag® Biotin*
- TDS #553 *BioMag® Protein A*
- TDS #554 *BioMag® Protein G*
- TDS #555 *BioMag® Dextran-coated Charcoal*
- TDS #557 *BioMag® Goat anti-Rat IgM*
- TDS #558 *BioMag® Goat anti-Mouse IgM*
- TDS #559 *BioMag® Goat anti-Rabbit IgG*
- TDS #560 *BioMag® Goat anti-Rat IgG*
- TDS #561 *BioMag® Goat anti-Human IgM*
- TDS #562 *BioMag® Goat anti-Human IgG (Fc Specific)*
- TDS #563 *BioMag® Goat anti-Human IgG*
- TDS #569 *BioMag® SelectaPure mRNA Purification System*
- TDS #570 *BioMag® Carboxyl*

Magnetic Microparticles con't.

- TDS #580 *BioMag® SelectaPure anti-Human CD3*
- TDS #581 *BioMag® SelectaPure anti-Human CD4*
- TDS #583 *BioMag® SelectaPure anti-Human CD8*
- TDS #584 *BioMag® SelectaPure anti-Human CD14*
- TDS #585 *BioMag® SelectaPure anti-Human CD16*
- TDS #586 *BioMag® SelectaPure anti-Human CD19*
- TDS #587 *BioMag® SelectaPure anti-Human CD34*
- TDS #588 *BioMag® SelectaPure anti-Human CD45*
- TDS #589 *BioMag® SelectaPure anti-Human CD56*
- TDS #590 *BioMag® SelectaPure anti-Human CD71*
- TDS #591 *Cell Sorting Using BioMag® SelectaPure anti-Human Leukocyte Particles*
- TDS #592 *BioMag® SelectaPure anti-Mouse CD4*
- TDS #593 *BioMag® SelectaPure anti-Mouse CD8a*
- TDS #594 *BioMag® SelectaPure anti-Mouse CD45R*
- TDS #595 *BioMag® SelectaPure anti-Human CD2*
- TDS #596 *BioMag® SelectaPure anti-Human CD11b*
- TDS #597 *BioMag® SelectaPure Human T cell Enrichment System*
- TDS #617 *BioMag®Plus Amine & BioMag®Plus Amine Protein Coupling Kit*
- TDS #618 *BioMag®Plus Carboxyl & BioMag®Plus Carboxyl Protein Coupling Kit*
- TDS #619 *BioMag®Plus Goat anti-Mouse IgG Particle Antibody Coupling Starter Kit*
- TDS #620 *BioMag®Plus Protein A and G Particle Antibody Isolation Starter Kit*
- TDS #621 *BioMag®Plus Streptavidin & BioMag®Plus Streptavidin / Biotin Binding Starter Kit*
- TDS #658 *ProMax Albumin Removal Kit*
- TDS #659 *ProMax Serum IgG Removal Kit*
- TDS #692 *BioMag®Plus Mouse anti-Fluorescein IgG*
- TDS #721 *BioMag® Maxi Carboxyl*
- TDS #722 *BioMag® Maxi Amine*
- TDS #745 *ProMag™ HC High Capacity Magnetic Microspheres*
- TDS #755 *ProMag™ Magnetic Microspheres*
- TDS #759 *BioMag®Plus Wheat Germ Agglutinin*
- TDS #766 *BioMag®Plus Concanavalin A*
- TDS #855 *Magnetic Particles – ProMag™ and BioMag®*
- TDS #1003 *ProMag™ High Performance Magnetic Microspheres*

Magnetic Separators

- TDS #571 *BioMag® Flask Separator*
- TDS #572 *BioMag® 15ml / 50ml Tube Separator*
- TDS #573 *BioMag® 12mm x 75mm Test Tube Separator*
- TDS #574 *BioMag® Multi-32 Microcentrifuge Tube Separator*
- TDS #575 *BioMag® 96-Well Plate Separator*
- TDS #575A *BioMag® 96-Well Plate Side Pull Magnetic Separator*
- TDS #576 *BioMag® Multi-6 Microcentrifuge Tube Separator*
- TDS #577 *BioMag® Solo-Sep Microcentrifuge Tube Separator*
- TDS #791 *BioMag® MultiSep Magnetic Separator*
- TDS #796 *Biomagnetic Separators*

NIST Traceable Particle Size Standards

- TDS #623 *Precision Particles: NIST Traceable Size Standards*

Polymer Microspheres

- TDS #238 *Polybead® Polystyrene Microspheres: FAQ*
- TDS #238C *Covalent Coupling of Proteins to Carboxylated Polystyrene Microparticles by the "Carbodiimide" Method*
- TDS #238D *Covalent Coupling of Proteins to Amino & Blue Dyed Microspheres*
- TDS #238E *Protocol for Adsorbing Proteins on Polystyrene Microspheres*
- TDS #238G *Glutaraldehyde Kit for Amino & Blue Dyed Beads*
- TDS #404 *Polyballs*
- TDS #644 *PolyLink Protein Coupling Kit for COOH Microparticles*
- TDS #788 *Polybead® Microspheres*
- TDS #853 *PolyLink Protein Coupling Kit with Hollow Fiber Filtering System*
- TDS #854 *Glutaraldehyde Coupling Kit with Hollow Fiber Filtering System*
- TDS #856 *Polystyrene Beads, Large*

Protein Coated Microspheres

- TDS #615 *Protein Conjugated Microspheres*
- TDS #616 *Streptavidin & Biotin Conjugated Microspheres*

SNARe™ DNA Purification Systems

- TDS #710 *SNARe™ Whole Blood Genomic DNA Purification System*
- TDS #710A *SNARe™ Whole Blood Genomic DNA Purification 96-Well Microtiter Plate Protocol*
- TDS #711 *SNARe™ Plasmid DNA Purification System*
- TDS #712 *SNARe™ Plant Genomic DNA Purification System*

SureCount™ Particle Count Standards

- TDS #852 *SureCount™ Particle Count Standards*

Uniform Silica Microspheres

- TDS #635 *Uniform Silica Microspheres*
- TDS #792 *Silica Microspheres, Colloidal*

ViaCheck™ Viability Instrument Standards

- TDS #729 *ViaCheck™ 0% Viability Control*
- TDS #729 *ViaCheck™ 25% Viability Control*
- TDS #729 *ViaCheck™ 50% Viability Control*
- TDS #729 *ViaCheck™ 75% Viability Control*
- TDS #729 *ViaCheck™ 90% Viability Control*
- TDS #729 *ViaCheck™ 100% Viability Control*
- TDS #734 *ViaCheck™ Concentration Control (1 x 10^6)*
- TDS #734 *ViaCheck™ Concentration Control (4 x 10^6)*
- TDS #734 *ViaCheck™ Concentration Control (8 x 10^6)*

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High Performance Adhesives, Coatings & Encapsulants

Application

Flagship Product Lines

Polymer Type

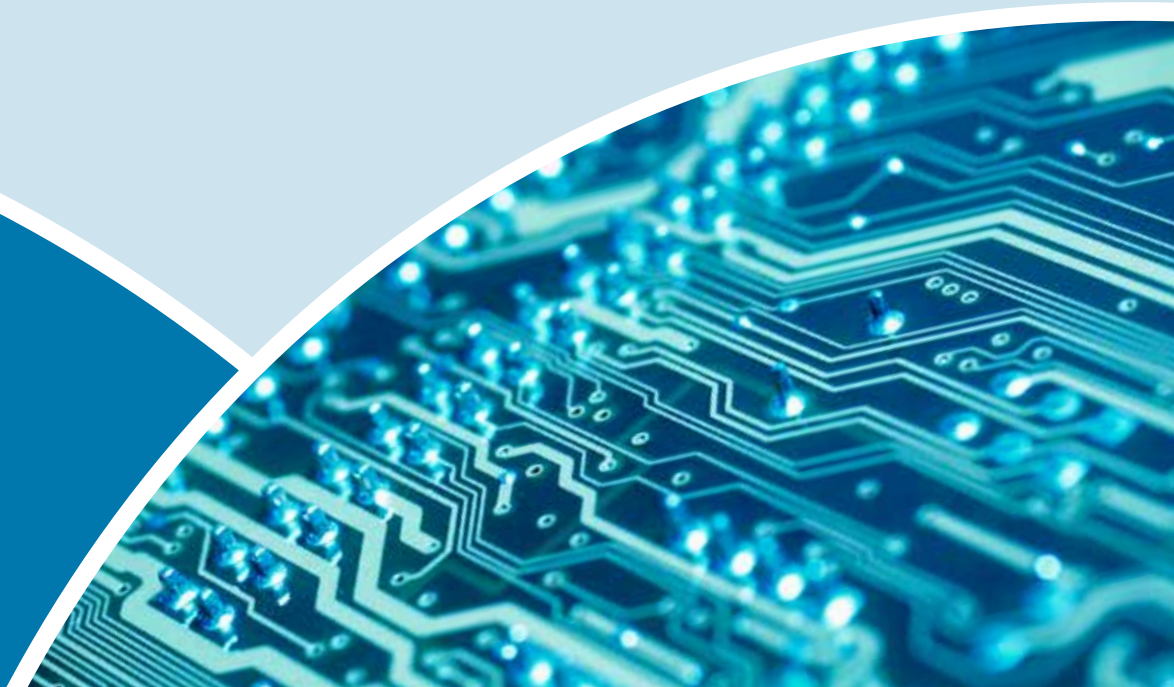
Cure Type

Chemicals for CMP (Chemical Mechanical Polishing)

NIST Traceable Precision Particle Size Standards

JEDEC Reference Guide

High Performance / Electronic Materials Glossary of Terms



Flagship Products

EasyFill™ Underfills

EdgeCONTROL™ Dams

LoSTRESS™ Dam & Fill/Glob Top Encapsulants

NoSWEEP™ Wire Bond Encapsulants

OptiCLEAR™ Transparent Liquid Encapsulants

StenSEAL™ Stencil Applied Glob Top Encapsulants

ZipCURE™ Die Attach Adhesives

New Products

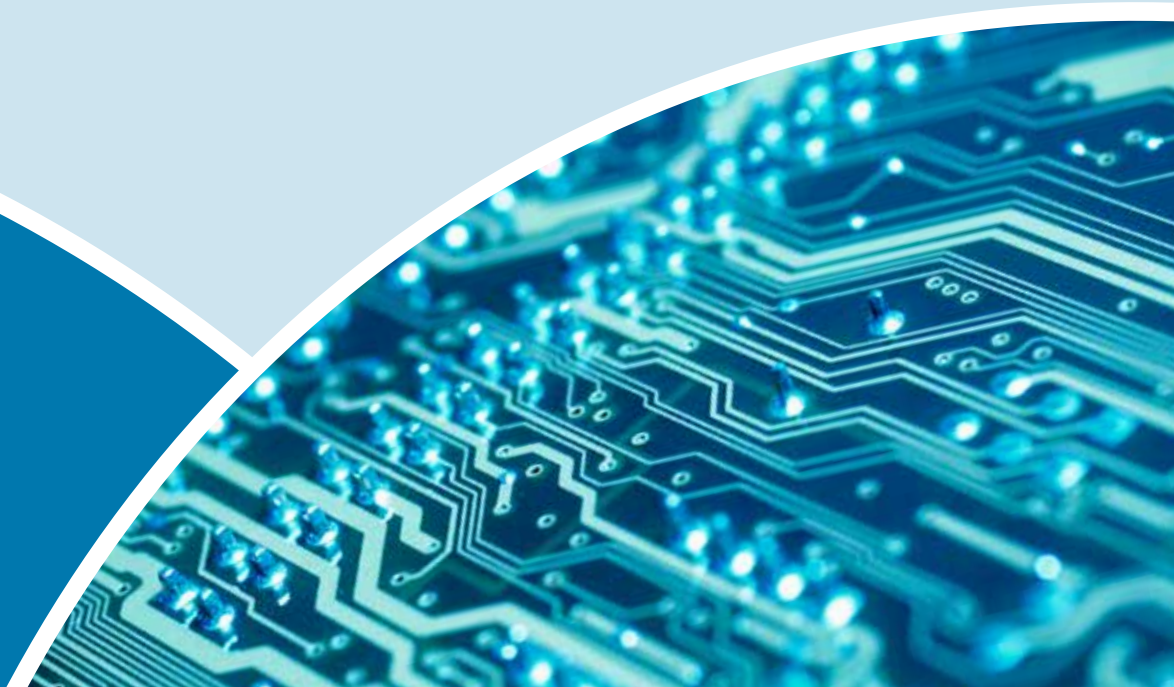
PC8007 Wire Bond Encapsulant 470

SF51 Liquid Encapsulant 471

PC232 A&B Epoxy Adhesive Kit 476

PC1201 A&B Epoxy Adhesive Kit 476

SF504A Liquid Encapulant 483



Polysciences, Inc. offers innovative polymer products to meet the high performance requirements of the electronic and semiconductor industry. Our expanded line of electronics polymers and chemicals includes underfills, liquid encapsulants, die attach and optical adhesives for advanced applications. Additionally, we provide custom formulation, high purity polymer and monomer synthesis, as well as contract packaging services. Our High Performance Adhesives, Coatings & Encapsulants division is ISO 9001 certified.

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Application

Adhesives

Die Attach

ZipCURE™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
DC2000	Non-conductive epoxy designed for die attach bonding. Good durability, good adhesion, & low cure stress on sensitive devices. Thermally curable.	20	30/150 + 15/165	130	60/160	2000	90D	N/A

General Component Assembly

Conformal Coat

Epoxy based coating & sealant with high heat resistance, chemical resistance, excellent adhesion & durability. Low viscosity, high gloss & curable by heat.

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1001		.1	1/150	125	70	2500	85D	N/A
CC1002		.4	1/150	125	70	2500	85D	N/A
CC1003		.6	1/150	125	70	2500	85D	N/A
CC1004		2	1/150	125	70	2500	85D	N/A

Epoxy Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! PC1201 A&B	2 component epoxy encapsulant for applications requiring high thermal conductivity, heat resistance, rigidity, & dimensional stability. Excellent adhesion to many substrates including metals, themosetting plastics, & ceramics, good durability, high modulus, low CTE, & thermally curable.	25	1 hr @ 100 °C + 1hr @ 165 °C	190	15	2500	90D	

High IR Absorption Epoxy Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC610K-1	2 component, epoxy product designed for applications requiring high absorption (low reflectivity) of infra red radiation. High heat resistance, high modulus, good dimensional stability, durable, & thermally curable.	20	1/150	150	50	3200	85D	N/A

Polyurethane Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HPA900	2 component polyurethane designed for bonding applications requiring adhesion to hard to bond surfaces. Excellent adhesion to many metals, plastics, & elastomers, & quick cure time at room temperature.	.2	24/RT	20	200	.5	85D	N/A

Potting Compound Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC200AB-1	2 component epoxy designed for bonding, encapsulating, & sealing applications. Excellent adhesion to many substrates, useful for a wide range of applications, fire resistant & ambient temperature curable.	4	8/RT	65	140	12	75D	N/A

Potting Compound Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC310A&B	2 component, unfilled, epoxy based encapsulant designed for potting, bonding, & encapsulation usage. Good adhesion to many metals, ceramics, & other materials, good chemical resistance, & room temperature or thermally curable.	3	1/60	65	100	25	80D	N/A
PC600A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & very high Tg. Rapid thermal curing.	.2	1/100 + 1/150 + 1/200	200	60	1000	90D	N/A
PC620A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	20	2/150 + 2/200	210	50	3550	90D	N/A

Silicone Pressure Sensitive Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV102A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	30	0.5/60	<-70	300	.1	15A	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC520	Low temperature curable, structural epoxy adhesive with high strength & durability. Useful for demanding bonding applications requiring high performance properties. Good adhesion to many metals, ceramics, & thermosetting plastics.	200	0.5/150	135	50	1200	80D	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC500	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	150	0.5/150	125	100	400	80D	N/A

UV Curable Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7020	100% solids, UV curable adhesive useful for adhering many difficult to bond materials used for electronic & medical device assembly. Flowable viscosity, fast cure, tough, & elastomeric.	.2	UV	55	120	4	60A	N/A

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

UV Curable Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7050	UV curable epoxy product well suited for use in applications requiring high heat resistance, rigidity, & durability. Low viscosity, good adhesion, high modulus, high strength, & rapid cure.	.5	UV 10″	120	75	200	75D	N/A

UV Curable Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7030	UV curable adhesive with excellent adhesion to a wide range of materials. Well suited for use in applications requiring bonding to hard to adhere substrates. Rigid, wide temperature use range, & cures in seconds.	1	UV	70	80	80	70D	N/A

Versatile, Tough Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC550A&B	2 component, epoxy adhesive designed for bonding & sealing when high strength & toughness is required. Non-rigid, tough, & good adhesive properties to many substrates including metals, composites, ceramics, many plastics, & especially good for bonding fiberglass. Room temperature or thermal curing.	40	4/RT	70	120	100	70D	N/A

Coatings

Conformal

Conformal Coat

Epoxy based coating & sealant with high heat resistance, chemical resistance, excellent adhesion & durability. Low viscosity, high gloss & curable by heat.

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1001		.1	1/150	125	70	2500	85D	N/A
CC1002		.4	1/150	125	70	2500	85D	N/A
CC1003		.6	1/150	125	70	2500	85D	N/A
CC1004		2	1/150	125	70	2500	85D	N/A

UV Curable Conformal Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1200-1Q	Fast UV curing, no mix coating with good adhesion, no volatile emissions, a wide temperature use range, & fluorescence. Curable by UV or UV & heat.	1.5	UV or UV + 0.5/120	70	100	25	65D	N/A

Wafer Level

Wafer Level Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
WL2000	Epoxy based protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL2010	Epoxy based, protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL4000	Epoxy based negative photoresist coating suited for applications at the wafer level. Rapidly curable by UV light, good adhesive properties, high heat resistance, & durable. Applied by brush, dip, spin coat, or spray methods.	.1	UV 600-900 mJ + 1/150	130	<30	3000	85D	N/A

Encapsulants

Wire Bond

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW7072	100% solid, silica filled liquid encapsulent for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. Thermally curable & non-sweeping. Available in dam & fill or glob top versions.	150	2/130 + 2/170	180	15	4000	80D	N/A
EW7073	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra-fine pitch wire bonds on semiconductor devices. UV & thermally curable & non-sweeping. Available in dam & fill or glob top versions.	250	UVA 1 J/cm2 @ 90 + 1/130 + 3/175	174	23	4000	80D	N/A
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A
EW8003	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	100	1/100 + 1/165	170	12	4000	85D	N/A
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW2000	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. UV curable & non-sweeping. Available in dam & fill or glob top versions.	20	UV	150	20	500	75D	N/A

Glob Top

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD54G0	Low modulus retention dam specifically formulated to offer low cure stress & low warpage for liquid encapsulation of BGA & MCM packages. Good adhesion to various rigid and flexible organic & ceramic substrates, high viscosity, high thixotropy, & thermally curable. Designed to be used with LoSTRESS™ liquid encapsulant.	100	UV or 1/150	-20	130	1.5	85A	N/A
SD1010	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable. Designed to be used with NoSWEEP™ EW8000 series encapsulant.	1000	1/100 + 1/165	165	40	2000	85D	N/A
SD1011	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable.	30	1/100 + 1/165	180	15	4000	85D	N/A

LoSTRESS™ Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! SF51	Very low modulus, low Tg fill material specifically designed to offer low cure stress & low warpage. Epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring good aging resistance, toughness, & strong adhesion to various substrates. Thermally curable.	15	1 hr @ 150°C	-40		1.2	45A	N/A
SF54GB	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	25	1/150 + 1/160	-20	150	5	30D	N/A
SF5002	Low modulus, flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic.	10	1/150 + 1/160	-20	150	5	80A	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW2000	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. UV curable & non-sweeping. Available in dam & fill or glob top versions.	20	UV	150	20	500	75D	N/A
EW7072	100% solid, silica filled liquid encapsulent for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. Thermally curable & non-sweeping. Available in dam & fill or glob top versions.	150	2/130 + 2/170	180	15	4000	80D	N/A
EW7073	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra-fine pitch wire bonds on semiconductor devices. UV & thermally curable & non-sweeping. Available in dam & fill or glob top versions.	250	UVA 1 J/cm2 @ 90 + 1/130 + 3/175	174	23	4000	80D	N/A
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A
EW8003	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	100	1/100 + 1/165	170	12	4000	85D	N/A
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF503A	Liquid encapsulant fill material specifically designed to offer efficient light transmission & low cure stress. 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	2	UV or 1/130	100	70	50	60D	N/A
SF801A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications require good optical clarity. Curable at ambient temperatures or preferably with moderate heat, excellent adhesion to many substrates including metals, glass, & ceramics, low viscosity, & thermally curable.	.3	1/80	50	125	20	50D	N/A
SF850K-1	2 component epoxy designed for encapsulating & coating applications requiring good clarity & high heat resistance. Excellent adhesion to many substrates including metals, glass, & ceramics.	.5	1.5/150	150	60	500	80D	N/A
SF860-1	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring low color, good clarity, & high Tg. Cures rapidly at elevated temperature.	1.5	2/120	130	80	400	80D	N/A
SF900A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring optical clarity & excellent UV resistance. Non-rigid, ambient temperature or thermally curable, & excellent adhesion to many substrates including metals, glass, & ceramics.	.5	0.5/100	60	120	20	65A	N/A
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A

Rapid Heat Curing Epoxy Adhesive/Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC570	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	1	0.08/150	130	60	400	85D	N/A

Silicone Elastomer

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV200A&B	2 component, high strength, silicone elastomer with many useful features including a wide service temperature range of use, good environmental stability, & good cured flexibility. Well suited for many sealing & bonding applications, transluscent, low modulus, & thermally curable.	30	0.5/60	<-70	250	1	30A	N/A

Silicone Gel Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV100A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	.3	0.5/60	<-70	300	.05	5A	N/A

Silicone Gel Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV331-1	2 component, low viscosity silicone encapsulant suitable for encapsulation applications including sensitive optoelectronic assemblies. Stress free & thermally curable.	.2	0.3/65	<-70	200	.1	20A	N/A

StenSEAL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
ES8010	100% solid, silica filled epoxy with high strength, modulus, & heat resistance. Low warpage & good adhesion to die, substrates, & other inter facing materials. Applied by extrusion or screen-printing & thermally curable.	250	1/100 + 1/165	180	15	3500	90D	N/A

Thermally Conductive Silicone Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV330-1	2 component, thermally conductive silicone encapsulant with a wide service temperature range of use, fire resistance, good environmental stability, & good cured flexibility. Rapid heat curable.	30	1/60	<-70	150	5	80A	1.5

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

UV Curable Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7050	UV curable epoxy product well suited for use in applications requiring high heat resistance, rigidity, & durability. Low viscosity, good adhesion, high modulus, high strength, & rapid cure.	.5	UV 10"	120	75	200	75D	N/A

Dam & Fill

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD8002	100% solids, liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants & other bonding uses requiring minimal flow during curing. Dimensional stability, low stress, & thermally curable.	200	1/100 + 1/165	150	15	3500	85D	N/A

Underfills

EasyFILL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
UC3111	Low modulus capillary flow underfill with low stress cure & high moisture resistance. Thermally curable.	2.5	1/130 + 1/150	100	80	>1000	85D	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
UC5001	Rapid curing capillary flow underfill with low stress cure, high durability, high Tg, & low CTE. Thermally curable.	12	0.2/150	135	<30/110	1000	90D	N/A

Potting Compounds

Epoxy Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! PC1201 A&B	2 component epoxy encapsulant for applications requiring high thermal conductivity, heat resistance, rigidity, & dimensional stability. Excellent adhesion to many substrates including metals, themosetting plastics, & ceramics, good durability, high modulus, low CTE, & thermally curable.	25	1 hr @ 100 °C + 1hr @ 165 °C	190	15	2500	90D	
New! PC232 A&B	Very low viscosity 2 component epoxy for encapsulating and potting applications. The cured product is a tough, high strength epoxy. The very low viscosity of the product makes it well suited for sealing narrow gap sections.	0.2	1.5 hr @ 100°C	70		1000	75 D	

Epoxy Encapsulant Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC220	2 component, low viscosity epoxy well suited for various potting, sealing, & bonding applications.	.4	4/RT	70	80	1000	80D	N/A
PC225	2 component, low viscosity, tough elastic epoxy well suited for various potting, sealing, & bonding applications. Good durability, low stress, & thermally curable.	.4		20	100	100	70A	N/A

High IR Absorption Epoxy Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC610K-1	2 component, epoxy product designed for applications requiring high absorption (low reflectivity) of infra red radiation. High heat resistance, high modulus, good dimensional stability, durable, & thermally curable.	20	1/150	150	50	3200	85D	N/A

Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV300A&B	2 component, silicone encapsulant designed for applications requiring high thermal conductivity & stability. Rapidly cures with moderate heat & easy to use.	10	1/60	<-70	200	3	50A	1.3

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV400A&B	2 component, addition cured silicone encapsulant designed for applications that require low stress & excellent electrical properties. Designed for potting & encapsulation where low cost & low viscosity is required. Room temperature or thermally curable.	10	1/60	<-70	150	5	80A	N/A

LoSTRESS™ Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! SF51	Very low modulus, low Tg fill material specifically designed to offer low cure stress & low warpage. Epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring good aging resistance, toughness, & strong adhesion to various substrates. Thermally curable.	15	1 hr @ 150°C	-40		1.2	45A	N/A
SF54GB	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	25	1/150 + 1/160	-20	150	5	30D	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A
SF503A	Liquid encapsulant fill material specifically designed to offer efficient light transmission & low cure stress. 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	2	UV or 1/130	100	70	50	60D	N/A
SF801A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications require good optical clarity. Curable at ambient temperatures or preferably with moderate heat, excellent adhesion to many substrates including metals, glass, & ceramics, low viscosity, & thermally curable.	.3	1/80	50	125	20	50D	N/A
SF850K-1	2 component epoxy designed for encapsulating & coating applications requiring good clarity & high heat resistance. Excellent adhesion to many substrates including metals, glass, & ceramics.	.5	1.5/150	150	60	500	80D	N/A
SF860-1	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring low color, good clarity, & high Tg. Cures rapidly at elevated temperature.	1.5	2/120	130	80	400	80D	N/A
SF900A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring optical clarity & excellent UV resistance. Non-rigid, ambient temperature or thermally curable, & excellent adhesion to many substrates including metals, glass, & ceramics.	.5	0.5/100	60	120	20	65A	N/A

Potting Compound Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC200AB-1	2 component epoxy designed for bonding, encapsulating, & sealing applications. Excellent adhesion to many substrates, useful for a wide range of applications, fire resistant & ambient temperature curable.	4	8/RT	65	140	12	75D	N/A

Potting Compound Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC310A&B	2 component, unfilled, epoxy based encapsulant designed for potting, bonding, & encapsulation usage. Good adhesion to many metals, ceramics, & other materials, good chemical resistance, & room temperature or thermally curable.	3	1/60	65	100	25	80D	N/A
PC410A&B	2 component, highly filled epoxy resin encapsulant designed for potting & encapsulation where high thermal conductivity is required. Excellent moisture resistance, low CTE, high strength, & room temperature or thermally curable.	70	1/80	70	50	250	93D	1.5
PC600A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & very high Tg. Rapid thermal curing.	.2	1/100 + 1/150 + 1/200	200	60	1000	90D	N/A

Rapid Heat Curing Epoxy Adhesive/Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC570	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	1	0.08/150	130	60	400	85D	N/A

Silicone Elastomer

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV200A&B	2 component, high strength, silicone elastomer with many useful features including a wide service temperature range of use, good environmental stability, & good cured flexibility. Well suited for many sealing & bonding applications, transluscent, low modulus, & thermally curable.	30	0.5/60	<-70	250	1	30A	N/A

Silicone Gel Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV100A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	.3	0.5/60	<-70	300	.05	5A	N/A

Silicone Gel Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV331-1	2 component, low viscosity silicone encapsulant suitable for encapsulation applications including sensitive optoelectronic assemblies. Stress free & thermally curable.	.2	0.3/65	<-70	200	.1	20A	N/A

Thermally Conductive Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC420A&B	2 component, ceramic, non-metal filled, epoxy-based product designed for potting & encapsulation where high strength & thermal conductivity are required, particularly useful for the assembly of components requiring heat dissipation. Curable at room temperature or by heat.	40	1/100	65	50	500	88D	1.25

Thermally Conductive Silicone Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV330-1	2 component, thermally conductive silicone encapsulant with a wide service temperature range of use, fire resistance, good environmental stability, & good cured flexibility. Rapid heat curable.	30	1/60	<-70	150	5	80A	1.5

UV Curable Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7020	100% solids, UV curable adhesive useful for adhering many difficult to bond materials used for electronic & medical device assembly. Flowable viscosity, fast cure, tough, & elastomeric.	.2	UV	55	120	4	60A	N/A

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

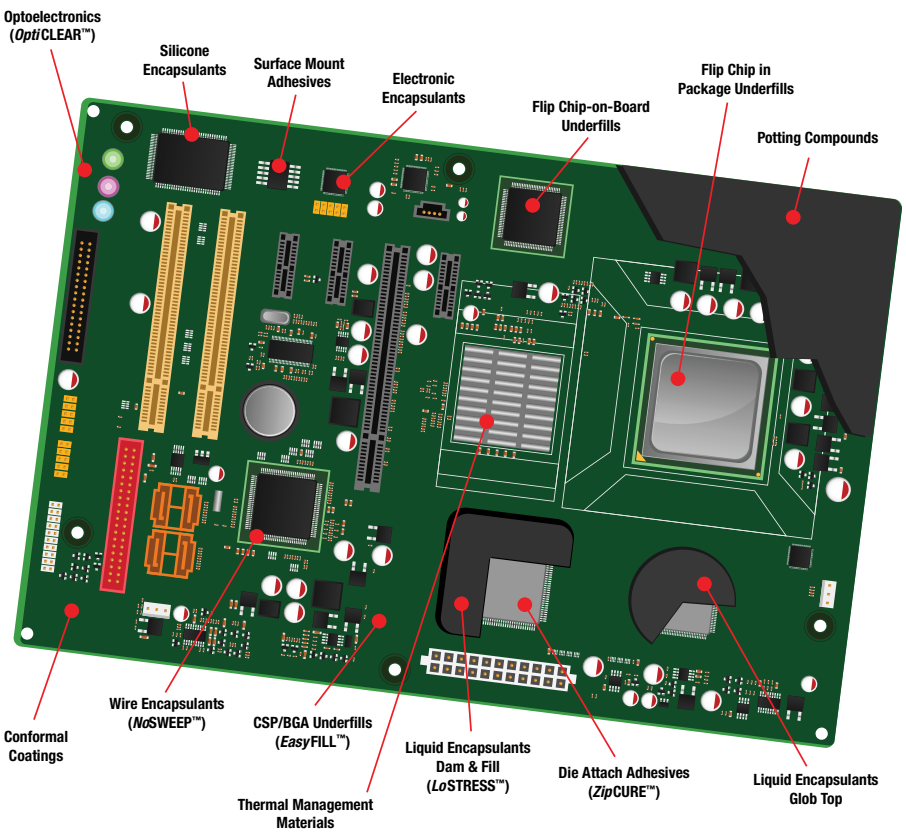
UV Curable Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7050	UV curable epoxy product well suited for use in applications requiring high heat resistance, rigidity, & durability. Low viscosity, good adhesion, high modulus, high strength, & rapid cure.	.5	UV 10"	120	75	200	75D	N/A

UV Curable Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7030	UV curable adhesive with excellent adhesion to a wide range of materials. Well suited for use in applications requiring bonding to hard to adhere substrates. Rigid, wide temperature use range, & cures in seconds.	1	UV	70	80	80	70D	N/A

Flagship Product Lines



EasyFILL™ Underfills

Polyscience's innovative EasyFILL™ Underfills products are characterized by their low stress cure and high durability. These capillary flow underfills lower stress, improve reliability and offer excellent processability for flip chip, CPS and BGA devices.

EasyFILL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
UC3111	Low modulus capillary flow underfill with low stress cure & high moisture resistance. Thermally curable.	2.5	1/130 + 1/150	100	80	>1000	85D	N/A
UC5001	Rapid curing capillary flow underfill with low stress cure, high durability, high Tg, & low CTE. Thermally curable.	12	0.2/150	135	<30/110	1000	90D	N/A

EdgeCONTROL™ Dams

Designed to work with LoSTRESS™ and NoSWEEP™ fill encapsulants. Polyscience's EdgeCONTROL™ Dams offer low warpage while maintaining high viscosities and excellent electrical insulation.

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD504	Low modulus retention dam specifically formulated to offer low cure stress & low warpage for liquid encapsulation of BGA & MCM packages. Good adhesion to various rigid and flexible organic & ceramic substrates, high viscosity, high thixotropy, & thermally curable. Designed to be used with LoSTRESS™ liquid encapsulant. Low temperature curable.	Gel	2 hr @ 100°C	-20		1.0	60A	N/A
SD54G0	Low modulus retention dam specifically formulated to offer low cure stress & low warpage for liquid encapsulation of BGA & MCM packages. Good adhesion to various rigid and flexible organic & ceramic substrates, high viscosity, high thixotropy, & thermally curable. Designed to be used with LoSTRESS™ liquid encapsulant.	100	UV or 1/150	-20	130	1.5	85A	N/A
SD1010	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable. Designed to be used with NoSWEEP™ EW8000 series encapsulant.	1000	1/100 + 1/165	165	40	2000	85D	N/A
SD1011	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable.	30	1/100 + 1/165	180	15	4000	85D	N/A
SD8002	100% solids, liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants & other bonding uses requiring minimal flow during curing. Dimensional stability, low stress, & thermally curable.	200	1/100 + 1/165	150	15	3500	85D	N/A

LoSTRESS™ Dam & Fill/Glob Top Encapsulants

LoSTRESS™ epoxy encapsulants have a low modulus of elasticity which puts minimal cure stress on fragile ceramic and/or flexible substrates. These encapsulants are novel, epoxy-based 100% solids (non-volatile), single component liquid semiconductor encapsulants designed for devices requiring high toughness, flame retardancy, and strong adhesion to various substrates such as metal, ceramic, and organic. LoSTRESS™ is especially suitable for SAW filter applications. LoSTRESS™ can virtually eliminate warp on ceramic surfaces due to the low cure stress. Dam and fill and glob top versions are available.

LoSTRESS™ Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! SF51	Very low modulus, low Tg fill material specifically designed to offer low cure stress & low warpage. Epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring good aging resistance, toughness, & strong adhesion to various substrates. Thermally curable.	15	1 hr @ 150°C	-40		1.2	45A	N/A
New! SF504A	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	35	2 hr @ 100°C	-20		1	50A	N/A
SF5002	Low modulus, flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic.	10	1/150 + 1/160	-20	150	5	80A	N/A
SF54GB	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	25	1/150 + 1/160	-20	150	5	30D	N/A

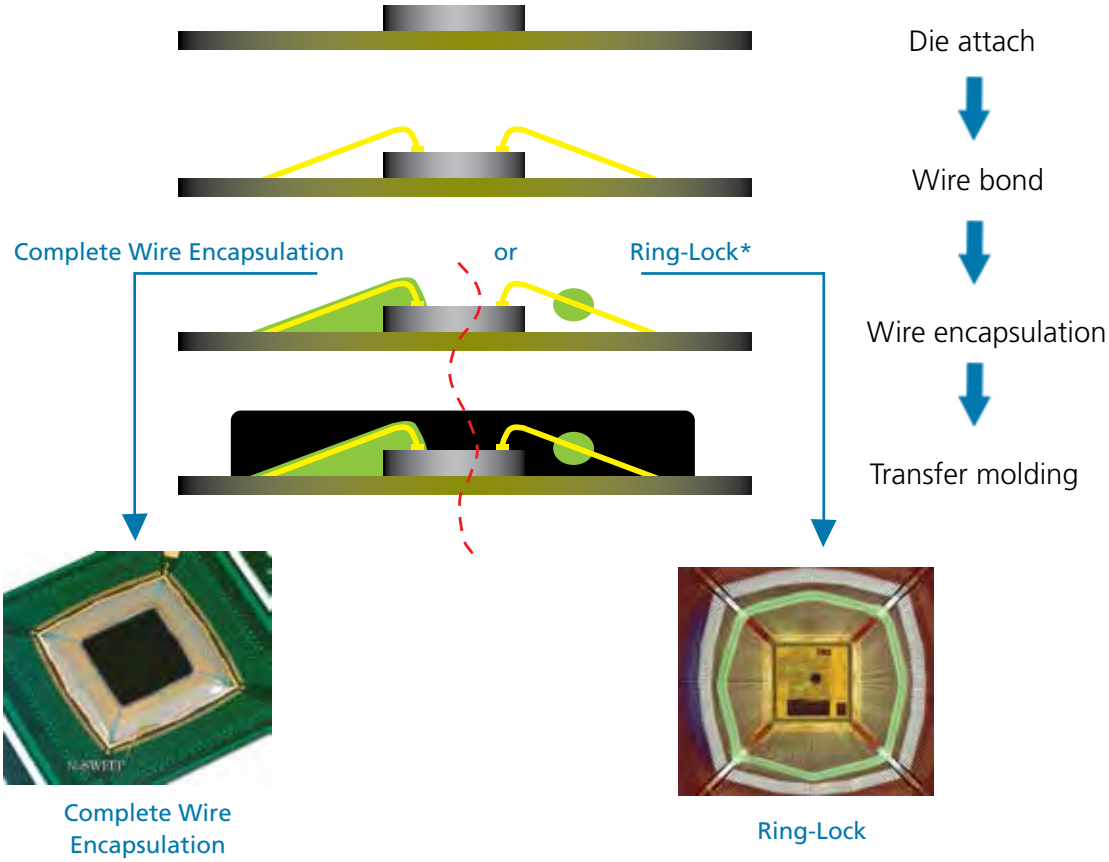
OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

The No*SWEEP*™ Patented Technology Process



Key Benefits vs. Conventional Molding Systems:

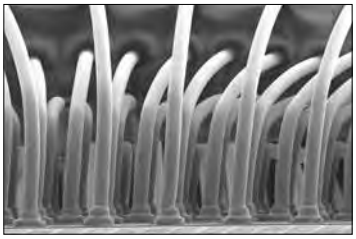
- Enables implementation of sub-35µm pitch roadmap wire bonding.
- Allows for the use of longer wires with low cost, high-density substrates and enables simple die shrinks.
- Enables cost reduction through the use of thinner diameter gold wire.
- Simplifies the design and production of complex stacked die and other 3-D package designs.
- *No***SWEEP**™ is Lead Free compatible.

NoSWEEP™ products continue on next page

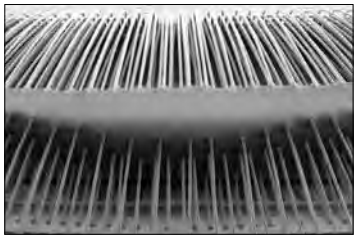
NoSWEEP™ Wire Bond Encapsulants

NoSWEEP™ wire bond encapsulants eliminate wire sweep during transfer molding by locking the wires together. This patented technology is ideal for ultra-fine pitch wire bonds, multi-tier bonding, and 3-D packaging. NoSWEEP™ can be dispensed on conventional off-line dispense systems or in-line on an on-wire bonder dispenser made by Kulike and Soffa. There are UV, UV/thermal, and thermal cure versions. The thermal cure glob top versions of NoSWEEP™ are designed for full device encapsulation. These products offer JEDEC Level 2A reliability and are designed to work with lead free (260°C) re-flow. There is also a compatible dam for package designs which are not glob top friendly.

The patented technology Ring-lock dispense method (developed jointly with Kulike & Soffa) was created especially for lead-frame and 3-D packages. NoSWEEPs unique high performance epoxy chemistry allows a very small bead of material to be extruded across the wires. The material encapsulates a small section of the wires and is then UV gelled to lock the polymer and the wires in place before molding. Because only a very small amount of polymer is used, this process is an extremely cost effective solution for wire sweep and allows much broader design leeway.



Side view SEM of *No***SWEEP**™ Ring-lock* dispense method completely encapsulating a wire section on a quad tier copper wire bonded device.



SEM of *No***SWEEP**™ Ring-lock* dispense method on the same quad tier copper wire bonded device.

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW2000	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. UV curable & non-sweeping. Available in dam & fill or glob top versions.	20	UV	150	20	500	75D	N/A
EW7072	100% solid, silica filled liquid encapsulent for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. Thermally curable & non-sweeping. Available in dam & fill or glob top versions.	150	2/130 + 2/170	180	15	4000	80D	N/A
EW7073	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra-fine pitch wire bonds on semiconductor devices. UV & thermally curable & non-sweeping. Available in dam & fill or glob top versions.	250	UVA 1 J/cm2 @ 90 + 1/130 + 3/175	174	23	4000	80D	N/A
EW8002	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. Available in dam & fill or glob top versions.	50	1 hr @ 100°C + 1hr @ 165°C	140	15	3000	85D	N/A
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
EW8003	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	100	1/100 + 1/165	170	12	4000	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

OptiCLEAR™ Transparent Liquid Encapsulants

Polysciences, Inc. optical adhesives and encapsulants are specifically formulated for use on optical sensors, digital cameras, light transmission devices, and doming applications.

OptiCLEAR™ is a line of transparent liquid encapsulants. These 100% solids (non-volatile), no odor epoxies can be UV and/or thermally cured for maximum process flexibility. They are engineered to work well when applied in thick or thin films, available in several viscosity ranges. OptiCLEAR™ products are excellent alternatives to acrylic encapsulants.

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A
SF503A	Liquid encapsulant fill material specifically designed to offer efficient light transmission & low cure stress. 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	2	UV or 1/130	100	70	50	60D	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF801A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications require good optical clarity. Curable at ambient temperatures or preferably with moderate heat, excellent adhesion to many substrates including metals, glass, & ceramics, low viscosity, & thermally curable.	.3	1/80	50	125	20	50D	N/A
SF850K-1	2 component epoxy designed for encapsulating & coating applications requiring good clarity & high heat resistance. Excellent adhesion to many substrates including metals, glass, & ceramics.	.5	1.5/150	150	60	500	80D	N/A
SF860-1	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring low color, good clarity, & high Tg. Cures rapidly at elevated temperature.	1.5	2/120	130	80	400	80D	N/A
SF900A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring optical clarity & excellent UV resistance. Non-rigid, ambient temperature or thermally curable, & excellent adhesion to many substrates including metals, glass, & ceramics.	.5	0.5/100	60	120	20	65A	N/A

StenSEAL™ Stencil Applied Glob Top Encapsulants

High viscosity resin system applied by screen or stencil printing to a component.

StenSEAL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
ES8010	100% solid, silica filled epoxy with high strength, modulus, & heat resistance. Low warpage & good adhesion to die, substrates, & other inter facing materials. Applied by extrusion or screen-printing & thermally curable.	250	1/100 + 1/165	180	15	3500	90D	N/A

ZipCURE™ Die Attach Adhesives

ZipCURE™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
DC2000	Non-conductive epoxy designed for die attach bonding. Good durability, good adhesion, & low cure stress on sensitive devices. Thermally curable.	20	30/150 + 15/165	130	60/160	2000	90D	N/A

Polymer Type

Acrylic Based

UV Curable Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7020	100% solids, UV curable adhesive useful for adhering many difficult to bond materials used for electronic & medical device assembly. Flowable viscosity, fast cure, tough, & elastomeric.	.2	UV	55	120	4	60A	N/A

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

UV Curable Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7030	UV curable adhesive with excellent adhesion to a wide range of materials. Well suited for use in applications requiring bonding to hard to adhere substrates. Rigid, wide temperature use range, & cures in seconds.	1	UV	70	80	80	70D	N/A

Epoxy Based

Conformal Coat

Epoxy based coating & sealant with high heat resistance, chemical resistance, excellent adhesion & durability. Low viscosity, high gloss & curable by heat.

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1001		.1	1/150	125	70	2500	85D	N/A
CC1002		.4	1/150	125	70	2500	85D	N/A
CC1003		.6	1/150	125	70	2500	85D	N/A
CC1004		2	1/150	125	70	2500	85D	N/A

EasyFILL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
UC3111	Low modulus capillary flow underfill with low stress cure & high moisture resistance. Thermally curable.	2.5	1/130 + 1/150	100	80	>1000	85D	N/A
UC5001	Rapid curing capillary flow underfill with low stress cure, high durability, high Tg, & low CTE. Thermally curable.	12	0.2/150	135	<30/110	1000	90D	N/A

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD1010	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable. Designed to be used with NoSWEEP™ EW8000 series encapsulant.	1000	1/100 + 1/165	165	40	2000	85D	N/A
SD1011	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable.	30	1/100 + 1/165	180	15	4000	85D	N/A
SD8002	100% solids, liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants & other bonding uses requiring minimal flow during curing. Dimensional stability, low stress, & thermally curable.	200	1/100 + 1/165	150	15	3500	85D	N/A

Epoxy Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer
New! PC1201 A&B	2 component epoxy encapsulant for applications requiring high thermal conductivity, heat resistance, rigidity, & dimensional stability. Excellent adhesion to many substrates including metals, themosetting plastics, & ceramics, good durability, high modulus, low CTE, & thermally curable.	25	1 hr @ 100 °C + 1hr @ 165 °C	190	15	2500	90D

Epoxy Encapsulant Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC220	2 component, low viscosity epoxy well suited for various potting, sealing, & bonding applications.	.4	4/RT	70	80	1000	80D	N/A
PC225	2 component, low viscosity, tough elastic epoxy well suited for various potting, sealing, & bonding applications. Good durability, low stress, & thermally curable.	.4		20	100	100	70A	N/A

High IR Absorption Epoxy Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC610K-1	2 component, epoxy product designed for applications requiring high absorption (low reflectivity) of infra red radiation. High heat resistance, high modulus, good dimensional stability, durable, & thermally curable.	20	1/150	150	50	3200	85D	N/A

LoSTRESS™ Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! SF51	Very low modulus, low Tg fill material specifically designed to offer low cure stress & low warpage. Epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring good aging resistance, toughness, & strong adhesion to various substrates. Thermally curable.	15	1 hr @ 150°C	-40		1.2	45A	N/A
SF5002	Low modulus, flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic.	10	1/150 + 1/160	-20	150	5	80A	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF54GB	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	25	1/150 + 1/160	-20	150	5	30D	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A
EW8003	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	100	1/100 + 1/165	170	12	4000	85D	N/A
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF801A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications require good optical clarity. Curable at ambient temperatures or preferably with moderate heat, excellent adhesion to many substrates including metals, glass, & ceramics, low viscosity, & thermally curable.	.3	1/80	50	125	20	50D	N/A
SF850K-1	2 component epoxy designed for encapsulating & coating applications requiring good clarity & high heat resistance. Excellent adhesion to many substrates including metals, glass, & ceramics.	.5	1.5/150	150	60	500	80D	N/A
SF860-1	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring low color, good clarity, & high Tg. Cures rapidly at elevated temperature.	1.5	2/120	130	80	400	80D	N/A
SF900A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring optical clarity & excellent UV resistance. Non-rigid, ambient temperature or thermally curable, & excellent adhesion to many substrates including metals, glass, & ceramics.	.5	0.5/100	60	120	20	65A	N/A

Potting Compound Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC200AB-1	2 component epoxy designed for bonding, encapsulating, & sealing applications. Excellent adhesion to many substrates, useful for a wide range of applications, fire resistant & ambient temperature curable.	4	8/RT	65	140	12	75D	N/A

Potting Compound Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC310A&B	2 component, unfilled, epoxy based encapsulant designed for potting, bonding, & encapsulation usage. Good adhesion to many metals, ceramics, & other materials, good chemical resistance, & room temperature or thermally curable.	3	1/60	65	100	25	80D	N/A
PC410A&B	2 component, highly filled epoxy resin encapsulant designed for potting & encapsulation where high thermal conductivity is required. Excellent moisture resistance, low CTE, high strength, & room temperature or thermally curable.	70	1/80	70	50	250	93D	1.5
PC600A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & very high Tg. Rapid thermal curing.	.2	1/100 + 1/150 + 1/200	200	60	1000	90D	N/A
PC620A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	20	2/150 + 2/200	210	50	3550	90D	N/A

Rapid Heat Curing Epoxy Adhesive/Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC570	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	1	0.08/150	130	60	400	85D	N/A

StenSEAL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
ES8010	100% solid, silica filled epoxy with high strength, modulus, & heat resistance. Low warpage & good adhesion to die, substrates, & other inter facing materials. Applied by extrusion or screen-printing & thermally curable.	250	1/100 + 1/165	180	15	3500	90D	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC520	Low temperature curable, structural epoxy adhesive with high strength & durability. Useful for demanding bonding applications requiring high performance properties. Good adhesion to many metals, ceramics, & thermosetting plastics.	200	0.5/150	135	50	1200	80D	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC500	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	150	0.5/150	125	100	400	80D	N/A

Thermally Conductive Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC420A&B	2 component, ceramic, non-metal filled, epoxy-based product designed for potting & encapsulation where high strength & thermal conductivity are required, particularly useful for the assembly of components requiring heat dissipation. Curable at room temperature or by heat.	40	1/100	65	50	500	88D	1.25

UV Curable Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7050	UV curable epoxy product well suited for use in applications requiring high heat resistance, rigidity, & durability. Low viscosity, good adhesion, high modulus, high strength, & rapid cure.	.5	UV 10"	120	75	200	75D	N/A

Versatile, Tough Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC550A&B	2 component, epoxy adhesive designed for bonding & sealing when high strength & toughness is required. Non-rigid, tough, & good adhesive properties to many substrates including metals, composites, ceramics, many plastics, & especially good for bonding fiberglass. Room temperature or thermal curing.	40	4/RT	70	120	100	70D	N/A

Wafer Level Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
WL2000	Epoxy based protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL2010	Epoxy based, protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL4000	Epoxy based negative photoresist coating suited for applications at the wafer level. Rapidly curable by UV light, good adhesive properties, high heat resistance, & durable. Applied by brush, dip, spin coat, or spray methods.	.1	UV 600-900 mJ + 1/150	130	<30	3000	85D	N/A

ZipCURE™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
DC2000	Non-conductive epoxy designed for die attach bonding. Good durability, good adhesion, & low cure stress on sensitive devices. Thermally curable.	20	30/150 + 15/165	130	60/160	2000	90D	N/A

Polyurethane Based

Polyurethane Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HPA900	2 component polyurethane designed for bonding applications requiring adhesion to hard to bond surfaces. Excellent adhesion to many metals, plastics, & elastomers, & quick cure time at room temperature.	.2	24/RT	20	200	.5	85D	N/A

Silicone Based

Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV300A&B	2 component, silicone encapsulant designed for applications requiring high thermal conductivity & stability. Rapidly cures with moderate heat & easy to use.	10	1/60	<-70	200	3	50A	1.3
HV400A&B	2 component, addition cured silicone encapsulant designed for applications that require low stress & excellent electrical properties. Designed for potting & encapsulation where low cost & low viscosity is required. Room temperature or thermally curable.	10	1/60	<-70	150	5	80A	N/A

Silicone Elastomer

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV200A&B	2 component, high strength, silicone elastomer with many useful features including a wide service temperature range of use, good environmental stability, & good cured flexibility. Well suited for many sealing & bonding applications, transluscent, low modulus, & thermally curable.	30	0.5/60	<-70	250	1	30A	N/A

Silicone Gel Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV100A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	.3	0.5/60	<-70	300	.05	5A	N/A

Silicone Gel Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV331-1	2 component, low viscosity silicone encapsulant suitable for encapsulation applications including sensitive optoelectronic assemblies. Stress free & thermally curable.	.2	0.3/65	<-70	200	.1	20A	N/A

Silicone Pressure Sensitive Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV102A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	30	0.5/60	<-70	300	.1	15A	N/A

Thermally Conductive Silicone Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV330-1	2 component, thermally conductive silicone encapsulant with a wide service temperature range of use, fire resistance, good environmental stability, & good cured flexibility. Rapid heat curable.	30	1/60	<-70	150	5	80A	1.5

Cure Type
UV Curable

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD54G0	Low modulus retention dam specifically formulated to offer low cure stress & low warpage for liquid encapsulation of BGA & MCM packages. Good adhesion to various rigid and flexible organic & ceramic substrates, high viscosity, high thixotropy, & thermally curable. Designed to be used with LoSTRESS™ liquid encapsulant.	100	UV or 1/150	-20	130	1.5	85A	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW2000	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. UV curable & non-sweeping. Available in dam & fill or glob top versions.	20	UV	150	20	500	75D	N/A

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A
SF503A	Liquid encapsulant fill material specifically designed to offer efficient light transmission & low cure stress. 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	2	UV or 1/130	100	70	50	60D	N/A

UV Curable Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7020	100% solids, UV curable adhesive useful for adhering many difficult to bond materials used for electronic & medical device assembly. Flowable viscosity, fast cure, tough, & elastomeric.	.2	UV	55	120	4	60A	N/A

UV Curable Conformal Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1200-1Q	Fast UV curing, no mix coating with good adhesion, no volatile emissions, a wide temperature use range, & fluorescence. Curable by UV or UV & heat.	1.5	UV or UV + 0.5/120	70	100	25	65D	N/A

UV Curable Encapsulant & Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7010	Flowable, 100% solids, UV curable encapsulant & adhesive useful for potting & bonding applications which are subject to a wide temperature range of exposure. Good adhesion to many engineering plastics used for electrical housings & switches, fast cure, tough, & elastomeric.	1.5	UV	45	150	2	75A	N/A

UV Curable Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7050	UV curable epoxy product well suited for use in applications requiring high heat resistance, rigidity, & durability. Low viscosity, good adhesion, high modulus, high strength, & rapid cure.	.5	UV 10″	120	75	200	75D	N/A

UV Curable Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC7030	UV curable adhesive with excellent adhesion to a wide range of materials. Well suited for use in applications requiring bonding to hard to adhere substrates. Rigid, wide temperature use range, & cures in seconds.	1	UV	70	80	80	70D	N/A

Wafer Level Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
WL2000	Epoxy based protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL2010	Epoxy based, protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A

Thermally Curable

Conformal Coat

Epoxy based coating & sealant with high heat resistance, chemical resistance, excellent adhesion & durability. Low viscosity, high gloss & curable by heat.

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1001		.1	1/150	125	70	2500	85D	N/A
CC1002		.4	1/150	125	70	2500	85D	N/A
CC1003		.6	1/150	125	70	2500	85D	N/A
CC1004		2	1/150	125	70	2500	85D	N/A

EasyFILL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
UC3111	Low modulus capillary flow underfill with low stress cure & high moisture resistance. Thermally curable.	2.5	1/130 + 1/150	100	80	>1000	85D	N/A
UC5001	Rapid curing capillary flow underfill with low stress cure, high durability, high Tg, & low CTE. Thermally curable.	12	0.2/150	135	<30/110	1000	90D	N/A

EdgeCONTROL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SD1010	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable. Designed to be used with NoSWEEP™ EW8000 series encapsulant.	1000	1/100 + 1/165	165	40	2000	85D	N/A
SD1011	100% solids liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants. Dimensional stability, low stress, rigid, durable, high Tg, & thermally curable.	30	1/100 + 1/165	180	15	4000	85D	N/A
SD54G0	Low modulus retention dam specifically formulated to offer low cure stress & low warpage for liquid encapsulation of BGA & MCM packages. Good adhesion to various rigid and flexible organic & ceramic substrates, high viscosity, high thixotropy, & thermally curable. Designed to be used with LoSTRESS™ liquid encapsulant.	100	UV or 1/150	-20	130	1.5	85A	N/A
SD8002	100% solids, liquid encapsulant designed for encapsulation & bonding applications requiring very high modulus & heat resistance. Thixotropic & well suited as a damming product for low viscosity encapsulants & other bonding uses requiring minimal flow during curing. Dimensional stability, low stress, & thermally curable.	200	1/100 + 1/165	150	15	3500	85D	N/A

Epoxy Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer
New! PC1201 A&B	2 component epoxy encapsulant for applications requiring high thermal conductivity, heat resistance, rigidity, & dimensional stability. Excellent adhesion to many substrates including metals, themosetting plastics, & ceramics, good durability, high modulus, low CTE, & thermally curable.	25	1 hr @ 100 °C + 1hr @ 165 °C	190	15	2500	90D

Epoxy Encapsulant Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC225	2 component, low viscosity, tough elastic epoxy well suited for various potting, sealing, & bonding applications. Good durability, low stress, & thermally curable.	.4		20	100	100	70A	N/A

High IR Absorption Epoxy Product

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC610K-1	2 component, epoxy product designed for applications requiring high absorption (low reflectivity) of infra red radiation. High heat resistance, high modulus, good dimensional stability, durable, & thermally curable.	20	1/150	150	50	3200	85D	N/A

Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV300A&B	2 component, silicone encapsulant designed for applications requiring high thermal conductivity & stability. Rapidly cures with moderate heat & easy to use.	10	1/60	<-70	200	3	50A	1.3
HV400A&B	2 component, addition cured silicone encapsulant designed for applications that require low stress & excellent electrical properties. Designed for potting & encapsulation where low cost & low viscosity is required. Room temperature or thermally curable.	10	1/60	<-70	150	5	80A	N/A

LoSTRESS™ Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
New! SF51	Very low modulus, low Tg fill material specifically designed to offer low cure stress & low warpage. Epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring good aging resistance, toughness, & strong adhesion to various substrates. Thermally curable.	15	1 hr @ 150°C	-40		1.2	45A	N/A
SF5002	Low modulus, flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic.	10	1/150 + 1/160	-20	150	5	80A	N/A
SF54GB	Low modulus, green flame retardant fill material specifically designed to offer low cure stress & low warpage. 100% solids, epoxy based liquid encapsulant designed for encapsulation of semiconductor devices requiring improves aging resistance, high toughness, green flame retardancy, & strong adhesion to various substrates such as metal, ceramic, & organic. Thermally curable.	25	1/150 + 1/160	-20	150	5	30D	N/A

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW7072	100% solid, silica filled liquid encapsulent for encapsulation of narrow diameter, long, & ultra fine pitch wire bonds on semiconductor devices. Thermally curable & non-sweeping. Available in dam & fill or glob top versions.	150	2/130 + 2/170	180	15	4000	80D	N/A
EW8002N	High temperature resistant epoxy well suited for many bonding & sealing applications requiring high modulus & high temperature resistance. High opacity, rigid, high strength, & thermally curable. Available in dam & fill or glob top versions.	30	1/100 + 1/165	150	15	3500	85D	N/A
EW8003	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	100	1/100 + 1/165	170	12	4000	85D	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW8004	100% solids liquid encapsulant designed for encapsulation of very narrow diameter, long & ultra fine pitch wire bonds on semiconductor devices. Cured thermally at lower temperatures than other wire bonding products & thus suitable for use on temperature sensitive substrates. Available in dam & fill or glob top versions.	50	0.5/150	160	15	3500	85D	N/A
New! PC8007	High performance epoxy for encapsulation applications. Well suited for many bonding & sealing uses requiring high modulus & high temperature resistance. Thermally curable.	6	1/100 + 1/165	160	15	4000	90D	N/A

OptiCLEAR™ Liquid Encapsulant Fill

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF5021-10	Low modulus fill material specifically designed to offer efficient light transmission & low cure stress. A 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	7	UV or 1/130	0	100	5	30D	N/A
SF503A	Liquid encapsulant fill material specifically designed to offer efficient light transmission & low cure stress. 100% solids, unfilled, liquid encapsulant designed for encapsulation of semiconductor devices requiring high toughness & strong adhesion to various substrates such as metal, ceramic, & organic. UV or thermally curable.	2	UV or 1/130	100	70	50	60D	N/A
SF801A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications require good optical clarity. Curable at ambient temperatures or preferably with moderate heat, excellent adhesion to many substrates including metals, glass, & ceramics, low viscosity, & thermally curable.	.3	1/80	50	125	20	50D	N/A
SF850K-1	2 component epoxy designed for encapsulating & coating applications requiring good clarity & high heat resistance. Excellent adhesion to many substrates including metals, glass, & ceramics.	.5	1.5/150	150	60	500	80D	N/A
SF860-1	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring low color, good clarity, & high Tg. Cures rapidly at elevated temperature.	1.5	2/120	130	80	400	80D	N/A

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
SF900A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring optical clarity & excellent UV resistance. Non-rigid, ambient temperature or thermally curable, & excellent adhesion to many substrates including metals, glass, & ceramics.	.5	0.5/100	60	120	20	65A	N/A

Potting Compound Liquid Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC310A&B	2 component, unfilled, epoxy based encapsulant designed for potting, bonding, & encapsulation usage. Good adhesion to many metals, ceramics, & other materials, good chemical resistance, & room temperature or thermally curable.	3	1/60	65	100	25	80D	N/A
PC410A&B	2 component, highly filled epoxy resin encapsulant designed for potting & encapsulation where high thermal conductivity is required. Excellent moisture resistance, low CTE, high strength, & room temperature or thermally curable.	70	1/80	70	50	250	93D	1.5
PC600A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & very high Tg. Rapid thermal curing.	.2	1/100 + 1/150 + 1/200	200	60	1000	90D	N/A
PC620A&B	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	20	2/150 + 2/200	210	50	3550	90D	N/A

Rapid Heat Curing Epoxy Adhesive/Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC570	2 component epoxy designed for bonding, encapsulating, & sealing applications requiring high strength, high rigidity, & high Tg. Thermally curable.	1	0.08/150	130	60	400	85D	N/A

Silicone Elastomer

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV200A&B	2 component, high strength, silicone elastomer with many useful features including a wide service temperature range of use, good environmental stability, & good cured flexibility. Well suited for many sealing & bonding applications, transluscent, low modulus, & thermally curable.	30	0.5/60	<-70	250	1	30A	N/A

Silicone Gel Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV100A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	.3	0.5/60	<-70	300	.05	5A	N/A

Silicone Gel Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV331-1	2 component, low viscosity silicone encapsulant suitable for encapsulation applications including sensitive optoelectronic assemblies. Stress free & thermally curable.	.2	0.3/65	<-70	200	.1	20A	N/A

Silicone Pressure Sensitive Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV102A&B	2 component clear silicone gel suitable for various applications. Inert, low modulus, low viscosity, clear, & thermally curable.	30	0.5/60	<-70	300	.1	15A	N/A

StenSEAL™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
ES8010	100% solid, silica filled epoxy with high strength, modulus, & heat resistance. Low warpage & good adhesion to die, substrates, & other inter facing materials. Applied by extrusion or screen-printing & thermally curable.	250	1/100 + 1/165	180	15	3500	90D	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC520	Low temperature curable, structural epoxy adhesive with high strength & durability. Useful for demanding bonding applications requiring high performance properties. Good adhesion to many metals, ceramics, & thermosetting plastics.	200	0.5/150	135	50	1200	80D	N/A

Structural Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC500	Structural epoxy adhesive with high strength & durability. Particularly useful for demanding bonding applications requiring very high performance properties. Tough, impact resistant, good adhesion to many metals, ceramics, & thermosetting plastics. Thermally curable.	150	0.5/150	125	100	400	80D	N/A

Thermally Conductive Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC420A&B	2 component, ceramic, non-metal filled, epoxy-based product designed for potting & encapsulation where high strength & thermal conductivity are required, particularly useful for the assembly of components requiring heat dissipation. Curable at room temperature or by heat.	40	1/100	65	50	500	88D	1.25

Thermally Conductive Silicone Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HV330-1	2 component, thermally conductive silicone encapsulant with a wide service temperature range of use, fire resistance, good environmental stability, & good cured flexibility. Rapid heat curable.	30	1/60	<-70	150	5	80A	1.5

Wafer Level Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
WL2000	Epoxy based protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL2010	Epoxy based, protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A

ZipCURE™

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
DC2000	Non-conductive epoxy designed for die attach bonding. Good durability, good adhesion, & low cure stress on sensitive devices. Thermally curable.	20	30/150 + 15/165	130	60/160	2000	90D	N/A

UV & Thermally Curable

NoSWEEP™ Wire Bond Encapsulant

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
EW7073	100% solid, silica filled liquid encapsulant for encapsulation of narrow diameter, long, & ultra-fine pitch wire bonds on semiconductor devices. UV & thermally curable & non-sweeping. Available in dam & fill or glob top versions.	250	UVA 1 J/cm2 @ 90 + 1/130 + 3/175	174	23	4000	80D	N/A

UV Curable Conformal Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
CC1200-1Q	Fast UV curing, no mix coating with good adhesion, no volatile emissions, a wide temperature use range, & fluorescence. Curable by UV or UV & heat.	1.5	UV or UV + 0.5/120	70	100	25	65D	N/A

Wafer Level Coating

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
WL2000	Epoxy based protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL2010	Epoxy based, protective &/or negative photoresist coating suited for applications at the wafer level. Excellent adhesion, good chemical resistance, low viscosity, high gloss, & UV &/or heat curable. Applied by brush, dip, spin coat, or spray methods.	.1	1/150	120	70	2500	85D	N/A
WL4000	Epoxy based negative photoresist coating suited for applications at the wafer level. Rapidly curable by UV light, good adhesive properties, high heat resistance, & durable. Applied by brush, dip, spin coat, or spray methods.	.1	UV 600-900 mJ + 1/150	130	<30	3000	85D	N/A

Room Temperature Curable

Epoxy Encapsulant Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC220	2 component, low viscosity epoxy well suited for various potting, sealing, & bonding applications.	.4	4/RT	70	80	1000	80D	N/A

Polyurethane Adhesive Kit

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
HPA900	2 component polyurethane designed for bonding applications requiring adhesion to hard to bond surfaces. Excellent adhesion to many metals, plastics, & elastomers, & quick cure time at room temperature.	.2	24/RT	20	200	.5	85D	N/A

Potting Compound Epoxy

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC200AB-1	2 component epoxy designed for bonding, encapsulating, & sealing applications. Excellent adhesion to many substrates, useful for a wide range of applications, fire resistant & ambient temperature curable.	4	8/RT	65	140	12	75D	N/A

Versatile, Tough Epoxy Adhesive

Cat. #	Description	Viscosity (kCps)	Optimal Cure (hrs/°C)	Tg (°C)	CTE (ppm)	Modulus (Mpa)	Durometer	Thermal Conductivity (W/m·K)
PC550A&B	2 component, epoxy adhesive designed for bonding & sealing when high strength & toughness is required. Non-rigid, tough, & good adhesive properties to many substrates including metals, composites, ceramics, many plastics, & especially good for bonding fiberglass. Room temperature or thermal curing.	40	4/RT	70	120	100	70D	N/A

Chemical Mechanical Polishing (CMP) Materials

Ultra Pure Chemicals for Electronic Processes

Chemicals for CMP *(Chemical Mechanical Polishing)*

Polysciences offers several unique surfactants/particle suspension aids for using in CMP. In addition to the ultra-pure semiconductor grade listed below, we can custom formulate or synthesize materials for your specific requirements.

Photoconductive Materials

N-Vinylcarbazole [1484-13-5] *HMO7g* 02429-25 25g
MW 193.3 mp 65-67° TSCA

Poly(N-vinylcarbazole) [25067-59-8] *A2g* 02428-50 50g
MW ~40,000 mp>320° n_D^{20} 1.683 Tg 200 ° TSCA

Conductive Polymers

Polyaniline, Emeraldine form (Acid doped) [25233-30-1] *U7g*
MW -15,000 d 1.36 Conductivity: 2^{-4} S/cm. 21288-5 5g
Soluble in: sulfuric acid, Me SO_3H

Polyaniline, Emeraldine form (Undoped) [5616-44-2]. 24043-5 5g
MW -15,000 d 1.36 Conductivity: 10^{-10}S/cm
Soluble in: sulfuric acid, Me SO_3H, Also DMF, NMP

Poly(N-vinylcarbazole) [25067-59-8] *A2g* 02428-50 50g
MW ~40,000 mp>320° n_D^{20} 1.683 Tg 200° TSCA

SARGEL® Water Indicating Paste . . . . . 24615-1 1oz tube
24615-12 12 x 1oz

Water indicating paste provides a fast, reliable way to detect water bottoms in storage tanks containing gasoline and gasoline /alcohol blends, diesel, jet fuel, fuel oil, solventsand other materials.

Instrument Standards

NIST Traceable Size Standards

Precision Size Standards are offered in three size groupings: Nanobead, Microbead and Megabead. They are measured on in-house instruments calibrated with NIST Standard Reference Materials. Each product is supplied with a Certificate of Traceability. The size, standard deviation, coefficient of variation and lot number are printed on the label for easy reference.

Nanobead NIST Traceable Particle Size Standards *A2dm*
Nanobead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 40nm to 950nm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range		
40nm	36 - 44nm	64004-15	15 ml
50nm	45 - 55nm	64005-15	15 ml
60nm	54 - 66nm	64006-15	15 ml
70nm	65 - 74nm	64007-15	15 ml
80nm	75 - 84nm	64008-15	15 ml
90nm	85 - 94nm	64009-15	15 ml
100nm	95 - 110nm	64010-15	15 ml
125nm	120 - 130nm	64011-15	15 ml
150nm	140 - 160nm	64012-15	15 ml
200nm	190 - 210nm	64013-15	15 ml
250nm	240 - 260nm	64014-15	15 ml
300nm	285 - 315nm	64015-15	15 ml
350nm	335 - 365nm	64016-15	15 ml
400nm	380 - 420nm	64017-15	15 ml
450nm	430 - 470nm	64018-15	15 ml
500nm	480 - 520nm	64019-15	15 ml
550nm	530 - 570nm	64020-15	15 ml
600nm	580 - 620nm	64021-15	15 ml
650nm	630 - 670nm	64022-15	15 ml
700nm	680 - 720nm	64023-15	15 ml
750nm	730 - 770nm	64024-15	15 ml
800nm	780 - 820nm	64025-15	15 ml
850nm	830 - 870nm	64026-15	15 ml
900nm	880 - 920nm	64027-15	15 ml
950nm	930 - 970nm	64028-15	15 ml

Instrument Standards

Microbead NIST Traceable Particle Size Standards *A2dm*

Microbead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 1.0µm to 9.0µm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range		
1.00µm	0.95 - 1.05µm	64030-15	15 ml
1.25µm	1.20 - 1.30µm	64035-15	15 ml
1.50µm	1.45 - 1.55µm	64040-15	15 ml
1.75µm	1.70 - 1.80µm	64045-15	15 ml
2.00µm	1.90 - 2.10µm	64050-15	15 ml
2.50µm	2.40 - 2.60µm	64055-15	15 ml
3.00µm	2.85 - 3.15µm	64060-15	15 ml
3.50µm	3.30 - 3.70µm	64065-15	15 ml
4.00µm	3.80 - 4.20µm	64070-15	15 ml
5.00µm	4.70 - 5.30µm	64080-15	15 ml
6.00µm	5.70 - 6.30µm	64090-15	15 ml
7.00µm	6.60 - 7.40µm	64100-15	15 ml
8.00µm	7.60 - 8.40µm	64110-15	15 ml
9.00µm	8.10 - 9.90µm	64120-15	15 ml

Megabead NIST Traceable Particle Size Standards *A2dm*

Megabead NIST Traceable Particle Size Standards are monodisperse polystyrene microspheres ranging from 10.0µm to 175.0µm. They are packaged in convenient, easy-to-use 15ml dropper bottles at 1% solids (w / v) in an aqueous suspension. Technical Data Sheet #623

Nom. Dia.	Size Range		
10.0µm	9.50 - 10.50µm	64130-15	15 ml
12.0µm	11.50 - 12.50µm	64140-15	15 ml
15.0µm	14.00 - 16.00µm	64155-15	15 ml
20.0µm	19.00 - 21.00µm	64160-15	15 ml
25.0µm	24.00 - 26.00µm	64165-15	15 ml
30.0µm	28.00 - 32.00µm	64170-15	15 ml
40.0µm	36.00 - 44.00µm	64180-15	15 ml
50.0µm	48.00 - 52.00µm	64190-15	15 ml
60.0µm	57.00 - 63.00µm	64200-15	15 ml
80.0µm	75.00 - 85.00µm	64210-15	15 ml
100.0µm	90.00 - 110.00µm	64220-15	15 ml
125.0µm	115.00 - 135.00µm	64225-15	15 ml
150.0µm	140.00 - 160.00µm	64230-15	15 ml
175.0µm	165.00 - 185.00µm	64235-15	15 ml

JEDEC Reference Guide

IPC/JEDEC J-STD-20 MSL Classifications

Floor Life			Soak Requirements			
			Standard		Accelerated	
Level	Time	Condition degC/%RH	Time (hrs) degC/%RH	Condition degC/%RH	Time (hrs) degC/%RH	Condition degC/%RH
1	Unlimited	<=30/85%	168+5/-0	85/85	n/a	n/a
2	1 year	<=30/60%	168+5/-0	85/60	n/a	n/a
2a	4 weeks	<=30/60%	696+5/-0	30/60	120+1/-0	60/60
3	168 hours	<=30/60%	192+5/-0	30/60	40+1/-0	60/60
4	72 hours	<=30/60%	96+2/-0	30/60	20+0.5/-0	60/60
5	48 hours	<=30/60%	72+2/-0	30/60	15+0.5/-0	60/60
5a	24 hours	<=30/60%	48+2/-0	30/60	10+0.5/-0	60/60
6	TOL	<=30/60%	TOL	30/60	n/a	60/60

Mil-Std-883, Method 1011 Specs: Thermal Shock Test

- Total Transfer Time <10 seconds
- Total Dwell Time >2 minutes
- Specified Temp reached in <5 minutes
- Must be conducted for a minimum of 15 cycles

Mil-Std-883 Method 1011 Thermal Shock Test Conditions.

Condition	Low Temp	High Temp
A	- 0 (+2/-10) °C	100 (+10,-2) °C
B	-55 (+0/-10) °C	125 (+10,-0) °C
C	-65 (+0/-10) °C	150 (+10,-0) °C

JEDEC JESD22-A106 Specs: Thermal Shock Test

- Total Transfer Time <10 seconds
- Total Dwell Time >2 minutes
- Specified Temp reached in <5 minutes
- Must be conducted for a minimum of 15 cycles

Mil-Std-883 Method 1011 Thermal Shock Test Conditions.

Condition	Low Temp	High Temp
A	-40 (+0/-30) °C	85 (+10/-0) °C
B	- 0 (+2/-10) °C	100 (+10,-2) °C
C	-55 (+0,-10) °C	125 (+10,-0) °C
D	-65 (+0,-10) °C	150 (+10,-0) °C

JEDEC Reliability Test References

Mil-Std-883, Method 1010 Specs: Temperature Cycle Test

- Total Transfer Time <= 1 minute
- Total Dwell Time >= 10 minutes
- Specified Temp reached in <= 15 minutes
- Must be conducted for a minimum of 10 cycles

Mil-Std-883 Method 1010 Temperature Cycle Test Conditions

Condition	Low Temp	High Temp
A	-55 (+0/-10) °C	85 (+10,-0) °C
B	-55 (+0/-10) °C	125 (+15,-0) °C
C	-65 (+0/-10) °C	150 (+15,-0) °C
D	-65 (+0/-10) °C	200 (+15,-0) °C
E	-65 (+0/-10) °C	300 (+15,-0) °C
F	-65 (+0/-10) °C	175 (+15,-0) °C

JEDEC JESD22-A104 Specs: Temperature Cycle Test

- Total Transfer Time <= 1 minute
- Total Dwell Time >= 10 minutes
- Specified Temp reached in <= 15 minutes
- Recommended for lot acceptance screen: 10 cycles
- Recommended for qualification: 1000 cycles

JEDEC JESD22-A104 Specs Temperature Cycle Test Conditions

Condition	Low Temp	High Temp
A-55	(+0/-10) °C	85 (+10,-0) °C
B-55	(+0/-10) °C	125 (+10,-0) °C
C-65	(+0/-10) °C	150 (+10,-0) °C
D-65	(+0/-10) °C	200 (+10,-0) °C
F-65	(+0/-10) °C	175 (+10,-0) °C
G-40	(+0/-10) °C	125 (+10,-0) °C
H-55	(+0/-10) °C	150 (+10,-0) °C

Summary of industry-standard HTS
(High Temperature Storage) conditions: 1000 hours at 150 °C.

Mil Std 883, Method 1008, Stabilization Bake Specs:

- Storage at a high temperature for a specified duration
- Test Condition A: 75 °C / 24 hours minimum
- Test Condition B: 125 °C / 24 hours minimum
- Test Condition C: 150 °C / 24 hours minimum
- Test Condition D: 200 °C / 24 hours minimum
- Test Condition E: 250 °C / 24 hours minimum
- Test Condition F: 300 °C / 24 hours minimum
- Test Condition G: 350 °C / 24 hours minimum
- Test Condition H: 400 °C / 24 hours minimum

High Performance / Electronic Materials Glossary of Terms

ALPHA-1 & ALPHA-2 (a1 & a2): Alpha 1 is the Coefficient of Thermal Expansion (see also CTE) below the glass transition temperature (Tg). Alpha 2 is the CTE above the Tg.

ALPHA EMISSIONS: Are radioactive, high energy particles that can damage semiconductor devices. Memory devices are especially sensitive to alpha emission because the passing of the alpha particle through the device can cause the memory to change its state from a 1 to a 0 or a 0 to a 1. The device does not fail, but because the memory now has the wrong value stored, it is called a soft failure. To avoid such failures, memory devices use only "low alpha" solder. Low alpha solder contains Lead which has less radioactivity than normal Lead. Because this low alpha Lead is scarce, it is more expensive.

ANISOTROPIC: material that has different values when measured in different directions. Some methods of die connections use anisotropic conductors, which is a suspension of metal particles in an adhesive tape or paste. The metal conducts through the tape/paste (vertically), but not in the plane of the tape (horizontally). The products are commonly called ACF for film and ACP for paste. The ACF or ACP is placed on the substrate and the die to be connected is flipped upside down and pushed into the paste to make the connections between the chip pads and the substrate conductors. Sometimes the pads have a gold bump on them to improve the connection.

BLEEDING: Die Attach adhesives will leak out from under the die before it is cured. This leakage is called "bleed". Since wire bonds will not stick in areas where bleed has occurred it is important that bleed not exceed a few mils. Bleeding can be controlled by formulation (filler particle size, resin/hardener selection) and process (cure temp, out time). In addition, material will bleed differently on different surfaces (Silver, Nickel, Palladium, solder mask, polyimide).

CAPILLARY ACTION: The action by which the surface of a liquid in contact with the walls of a capillary tube or between two closely spaced plates is drawn into the tube or between the plates by a wicking action. An example of capillary action is in Flip Chip assembly, the underfill is dispensed next to the die and the material is pulled into the gap by the force of capillary action.

CATALYST: A chemical that when added to other materials starts or speeds up a chemical reaction. The catalyst is not consumed in the reaction, it only acts to make the reaction take place.

CONDUCTIVITY, ELECTRICAL: How well a material allows electricity to flow through it. The inverse of conductivity is resistivity. Most polymers do not conduct electricity, so they have very low conductivity. To make them conduct electricity we add metal particles, usually flakes of Silver. In order for the combined polymer and metal to conduct electricity, the particles must be close enough to touch.

Table of Electrical Conductivity

Material	Resistivity (Ohm-cm) 10 E-6
Copper (Cu)	1.5
Silver (Ag)	1.5
Gold (Au)	2.0
Aluminum (Al)	2.4
Solder (60/40)	1.5
Die Attach Epoxy	100 to 400 (.0001 to .0004 ohm-cm)

CONDUCTIVITY, THERMAL: How well a material allows heat to flow through it. Most metals have good thermal conductivity but ceramic and polymers have poor thermal conductivity. In order to increase the thermal conductivity of polymers, they need to be filled with a material that conducts heat well. This can be a metal (cheapest and best way) but adding a metal will also make the polymer electrically conductive. To achieve improved thermal conductivity while allowing the polymer to remain an insulator, ceramic powders such as Alumina or Aluminum Nitride are added. The unit of measure of thermal conductivity is Watt/meter-Kelvin.

Table of Thermal Conductivity

Material	Thermal Conductivity (Watts/meter-Kelvin)
Diamond (C)	600
Silver (Ag)	410
Copper (Cu)	390
Gold (Au)	300
Aluminum (Al)	240
Alumina	40
Solder (60/40)	50
Silica	4
Typical Die Attach	1.5 to 2.0

CONFORMAL COATING: Low viscosity polymer coating typically spun or sprayed onto a device or semiconductor. These coatings protect the devices from the environment or provide electrical insulation value. They do not protect well against physical shock as they are only a thin coating.

CTE (Coefficient of Thermal Expansion): How much a material grows when heated (and shrinks when cooled). The unit of measure is parts per million/per degree centigrade. The CTE differences (CTE mismatch) among the materials in a semiconductor package will cause stresses as the part is exposed to temperature changes in its working life. In most cases, it is useful for an epoxy connecting two materials to have a CTE that falls between the CTE's of the materials being joined.

CTE's of Common Materials	ppm/C
Silica	1
Silicon Die	2.5 to 4
Alumina	6.5
Gold	14
FR4 Substrate	14
Copper	17
BT Laminate	20
Solder Ball	25
Unfilled Polymer	60 or higher

CURE: Non-specific term that is widely used to mean the solidification of a polymer. Curing can be accomplished by applying heat or UV light. Several intermediate steps take place during curing that also have non-specific definitions. When the outside layer of the liquid forms a rubbery coating this is called skinning. When the entire liquid material is solid, but has not yet achieved stable mechanical properties this is called gelling. When the material reaches its final mechanical properties it is said to be cured.

CURING PROFILE: Sometimes referred to as cure cycle or cure schedule, defines the time and temperature required to change the state of a material to achieve its best-desired performance characteristics.

DAM: A wall of material around the perimeter of a device. The dam is formed by dispensing a high viscosity material through a single nozzle that traces a pattern around the device. The dam's main function is to contain a low viscosity fill material that is applied to encapsulate the device.

DIE: A single semiconductor cut from a wafer.

DIE ATTACH: Adhesive that bonds the semiconductor die to the substrate. Can be thermally conductive or nonthermally conductive.

DIELECTRIC CONSTANT: Ratio of the capacitance of a material (materials that do not conduct electricity) to the capacitance of air. A measure of the insulating strength of a dielectric material.

DIELECTRIC LOSS: Electric energy transformed into heat in a dielectric subjected to changing electric fields. The amount of electrical energy lost to the dielectric.

DSC (DYNAMIC SCANNING CALORIMETER): Analytical instrument that measures the heat absorbed or released by a material as it's temperature is raised at a controlled rate. A significant change in the graph of this measure indicates a chemical reaction is occurring. This measure is used to determine the temperature at which an epoxy material will change from liquid to solid. This instrument also measures the percentage cure of epoxy materials.

DTA (DYNAMIC THERMAL ANALYSIS): DTA is an analytical instrument used to measure the effects of temperature on the performance of materials. It is key to determining the temperature at which a material changes phase, such as from a glass-like solid to a soft, rubbery condition. The temperature at which this transition occurs is referred to as the glass transition temperature, or Tg. This instrument can also measure modulus. It is an extension to the older means of using a TMA (Thermal Mechanical Analyzer) for some of these measurements.

ENCAPSULANT: A material that seals or covers a semiconductor to provide mechanical and environmental protection. Typical materials are: molding compound, glob top, dam & fill and potting compound.

EPOXY: Family of thermosetting resins that are used as the media for bonding and protecting semiconductor devices. The main advantages of epoxy are the ability to form strong bonds to many surfaces, low processing temperature and low cost. Epoxies come in many variations with many different properties.

EPOXY ANHYDRIDE: Anhydride is the curing agent most commonly used in semiconductor materials such as die attach adhesive. As a curing agent, it not only causes the polymerization reaction to occur, it becomes a part of the finished compound. The nature of the anhydride reaction is such that it starts to cause the epoxy to change to a solid (gel) at room temperature without the addition of heat.

EXTRACTABLE IONS: Ions in a material that are released in the presence of moisture. Normally measured by placing a material in boiling water for a pre-determined period of time. Then measuring the concentration of the ions in the water. A typical specification will report the ion (K+, Na+, Cl- or F-) as <20 ppm.

FILLER: Particles added to a compound to improve properties and or decrease cost. The filler in conductive die attach adhesive is usually Silver flake to improve conductivity. The filler in encapsulants and underfills is usually inert Silica to increase modulus, optimize CTE and reduce cost.

FILLET: Rounded configuration of material at the edge interface between two other materials. For die attach adhesive, the adhesive around the perimeter of the die that extends part way up the side of the die and slopes outward to the substrate. The shape of the fillet around a flip chip is very important to the ability of the assembly to withstand reliability tests.

FORMULATION: Specific combination of chemical components required to achieve a desired set of material properties.

GEL: The first stage of hardness as a material transforms from a liquid to a solid during curing.

GLASS TRANSITION TEMPERATURE (Tg): See Tg.

GLOB TOP: Moderately viscous liquid encapsulation material applied around and on top of a semiconductor. The viscosity of glob top allows it to be applied without a dam and still hold it's position and shape.

GPa (GigaPascal): Common unit of tensile strength, pressure and stress. For materials with very low modulus, the value may be expressed as MegaPascals (MPa). 1 GPa = 1000 MPa. For reference, 1 MPa = 145 psi. Also, 100,000 psi = .689 GPa. The expression of a material's elastic modulus is commonly given in units of GPa. The lower the number, the more elastic or rubbery the material. The higher the number, the more rigid the material.

HARDNESS: Property of a material that resists permanent indentation or scratching. Hardness is measured by making a mark with a special tool. The hardness tool has a tip of prescribed size and shape. The tool is pressed into the test material with a defined force. The depth that the tool penetrates into the test material is measured and compared to a chart of values. The chart of values is used to convert the depth into the measure of hardness, which is durometer. Common scales for measuring hardness are Shore and Rockwell. The Shore hardness is measured as a dimensionless unit from 0-100. The Shore D indenter is round and must be made of a material harder than the test piece. The Rockwell method uses a 10kg load (for soft materials) on a round indenter and the corresponding depth is measured.

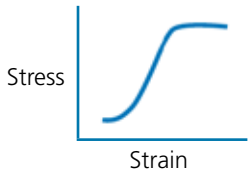
HAST (Highly Accelerated Stress Test): Subjecting a plastic package in water vapor at 131°C and 33.3 psi of pressure for 96 hours qualifies the packages' ability to survive heat and humidity. The test is considered equivalent to a standard 1000 hour test at 85% RH/85°C, because it usually activates the same failure mechanisms. The higher temperature and pressure conditions force the moisture into areas of the package much more quickly than other test methods that take a much longer time period to affect the integrity of the package. HAST achieves results quickly, 96 hours vs. 1000 hours of standard testing. This is a JEDEC reliability test (JEDEC Standard No. 22-Al10-A). An electrical bias may also be applied during the stress test. The higher temperature and pressure accelerate these failures.

JEDEC (Joint Electronic Device Engineering Council): A test and specification writing body of the Electronic Industry Association that establishes performance, outline and reliability standards in the United States.

JEDEC LEVELS: JEDEC testing classifies parts according to their ability to survive solder reflow after exposure to moisture. There are 6 levels of test; Level 6 is the least severe and Level 1 the most severe. They indicate how long a part can be exposed to ambient conditions without being baked dry. The test involves exposure to prescribed heat and humidity conditions for a set time followed by three passes through solder reflow. The highest level the parts survive indicate its level. The JEDEC Level is usually measured on the finished package. (See JEDEC testing schedules)

MODULUS OF ELASTICITY: Modulus is the amount of force per cross sectional area of material (stress) required to change the shape of the material divided by the amount of change in shape (strain). For example, it is the force applied to a steel rod that is required to cause the rod to stretch or get longer divided by the amount the rod stretches. Modulus is a measure of the flexibility or elasticity of a material. The lower the number, the more elastic the material. A rubber band has a very low modulus because it stretches very easily. An aluminum bar has a higher modulus because it takes more force to stretch it. Glass has a very high modulus; it will usually break before it stretches.

Modulus is frequently shown as a stress-strain graph:



In semiconductors, modulus is an indication of a material's ability to absorb stress induced during curing and temp cycle due to CTE mismatches between the die and substrate. The lower the elastic modulus the more stress absorbing capability. The unit of measurement for modulus is usually Giga-Pascal (GPa).

MSDS: Material Safety Data Sheet. Document that provides end users with chemical composition and safety information. It also includes handling information that is required by OHSA (Occupational Health & Safety Administration) in the US.

MONOMER: A molecule that can combine with others to form a polymer. During the curing process, monomers are joined together to form polymers.

OUTGAS: Amount of weight loss of an adhesive during curing or at elevated temperatures. Any solvent and low boiling temperature components of the polymer formulation can evaporate. The temperature and conditions entirely depend on the materials of the formulation. Bubbles formed as the outgas material tries to escape can form voids in the die attach, underfill or encapsulant. These voids can interfere with conductivity and adhesion. The gas can also condense on nearby bond pads and leads interfering with wire bonding.

PCT (PRESSURE COOKER TEST): Way to accelerate testing the moisture and temperature resistance of a device. Parts are put in a chamber at 2 atmospheres with water at 121°C to determine their moisture resistance. Since an autoclave is typically used for this test, it is also called the Unbiased Autoclave Test (JEDEC A102). The HAST (Highly Accelerate Stress Test) is a higher pressure and temperature version of the PCT in reliability testing.

pH: A measure of the acid/base nature of a material. Neutral, neither acid nor base, is a pH of 7. Numbers below 7 are very acidic. Numbers higher than 7 are very basic. The further the pH is away from 7, the stronger the acid or base. High pH materials can be present in detergents and soaps. Fluxes can be acidic. Extractable ionic contaminants in the epoxy materials can alter the pH from neutral in the presence of moisture. The acid or base formed by the ionics can causing corrosion.

POLYMER: Compounds consisting of large molecules made up by a linked series of short molecules called monomers. When the short molecules join together to form the long molecules, the material is said to have cured or polymerized. The structure of the polymer contributes most of the physical characteristics of materials containing them.

POLYMERIZE: Bonding of two or more monomers to form a polymer. The process of polymerizing is also called curing.

POT LIFE: Also known as working life. This is an indication of how long the material can be held at room temperature and still be processed. Two factors contribute to pot life limitations:
1) Increases in viscosity because the material begins to polymerize at room temperature; and 2) settling or separation of filler from the resin. In both cases, inconsistent dispensing results and performance in the finished package is inconsistent.

POTTING COMPOUND: Resin used to encapsulate or seal large areas of a device or combination of devices. Potting compounds are normally poured or dispensed into a device enclosure, filling the entire area.

REFLOW TEMPERATURE: Temperature that the device is sent through to melt solder. For lead solders this is typically 230°C, for lead free alloys the value is 260°C.

RESIN: Term used for the liquid portion of epoxy formulations. The resin is the polymer that performs the chain branching and crosslinking during cure. Resin provides many of the key performance properties of the resulting cured polymer. Unfilled materials are 100% resins. Filled materials such as die attach adhesive and underfill contain 20% to 40% resin.

RHEOLOGY: Description of the flow characteristics of a fluid. The properties of viscosity and thixotropic index are descriptors of the rheology of a material.

SEPARATION: Also known as Filler Settling. In Silver or Silica filled materials, the particles are in suspension from the mixing process. These products are frozen to the fillers in suspension and uniformly dispersed throughout the resin. At room temperature, gravity will cause the more dense filler particles to settle through the lighter polymer.

SHEAR STRENGTH: Key measure of adhesion for die attach adhesives and underfills. A shear strength tester pushes a die or a test part with increasing sideways force until the bond fails. Shear strength is reported in Kilograms (Kg), Kilograms Force (Kg-f), Kg/cm^2, and PSI. The total force is a function of the die size and type of substrate so it is important to always describe the parts being tested. Dage and Royce are two main suppliers of shear test equipment.

SHELF LIFE: Length of time that a material may be stored and still perform per specification. Many polymers require storage at low temperature in order to be stored successfully. This temperature is typically -40°C for most polymers used as adhesive and +4°C for molding compound. Two things lead to limits in shelf life; curing of the polymer and separation (settling) of the filler.

SILICA: Common name for Silicon Dioxide. Silica is the most commonly found material on earth. Silica has a very low CTE (as low as 1.5ppm), is chemically inert and in some forms can be inexpensive. It is an ideal material to use as filler for polymer materials. Silica comes in two common shapes, angular and spherical. The angular Silica is a ground up natural material (sand) and is very inexpensive. It is widely used for low cost applications such as low end molding compound. Unfortunately, because it has sharp points, it does not flow easily around obstructions (like solder bumps on a Flip Chip). It is also very abrasive and can scratch the very thin oxide on the surface of a die. Spherical Silica is fused (melted) to remove the sharp points and is preferred for advanced applications. Because the material is made using more steps it is more costly. As applications require the polymer to flow into very tight spaces (e.g., between fine pitch wires or low Flip Chip bumps) the Silica particles must be very small, typically not larger than 1/3 the narrowest gap.

SILICONES: Organic compounds containing Carbon, Hydrogen, Silicon and Oxygen. Because they contain Silicon and Oxygen they are also part of the larger set of chemicals called Siloxanes. Silicones are generally stable chemicals that resist many chemicals, have good adhesion when formulated as adhesives, resist moisture and are very flexible.

SILVER: Most commonly used conductive filler material. Silver is relatively inexpensive (compared to Gold), and is an excellent electrical and thermal conductor. Commonly used as flakes (tiny sheets) or kernels (rough spheres).

SINGLE COMPONENT (1K): Polymer that is premixed and ready to use, requiring shipping and storage conditions below -40°C to inhibit cure. 1K is also referred to as 1 part. Some polymers require mixing two or more separate liquids just before customer use. These are dual or multi component materials commonly called 2K or 2 part.

SLUMP: When screen printing or dispensing a relatively thick (tall) quantity of material, the material can collapse along its edge. This collapsing is known as slump. Slump limits the practical height to which a material can be screened or dispensed. As a rule of thumb, materials cannot be printed with a height that is more than 50% of the width of the finished pattern. This is known as the Aspect Ratio. If the height is the width of a dam, the Aspect Ratio is 1 to 2.

SNAP CURE: Describes die attach materials that cure in less than two minutes.

SOLVENT: Material used to dissolve a solid or to reduce the viscosity of a liquid. Many commonly used semiconductor polymers are so highly viscous that they require the addition of a solvent in order to get satisfactory flow. This solvent typically must evaporate (boil off) during the curing process. If not properly managed, this can lead to voids in the cured material.

SYNTHESIS: Formation of a compound from simpler compounds or elements. When organic chemicals are combined to create new properties without changing the structure of the molecules they are said to have been formulated.

Tg (Glass Transition Temperature): Most materials such as metals and ceramics do not have any sudden shift in their properties over temperature. The properties may change slowly, but the change is continuous. That is not true for most polymers. Many polymer materials undergo an abrupt change in their mechanical properties at a temperature which is called the glass transition temperature. Below the glass transition temperature, polymer materials are somewhat glass like, they are stiffer and have relatively low CTE. Above the glass transition temperature, polymers are less stiff but have higher CTE. In some polymers the change in properties can be very large. For example the CTE above the Tg can be three times than below it. This makes Tg and CTE a very important contributor to stresses generated by thermal changes.

THERMAL CYCLING: General term that refers to repeatedly raising and lowering the temperature of a circuit to see if it deteriorates. Cycling can be done by moving the test unit between temperature extremes slowly or rapidly. If cycling is done rapidly it is referred to 1,000,000 cps.

as thermal shock. Most thermal cycling is done for 1000 cycles. The temperature extremes to which the unit is cycled depends on the intended application as follows:

The JEDEC definition for Thermal Cycling requires achievement of the temperature limit within 15 minutes.

	Realistic Representative Use Environments		Accelerated Test Condition	
Application	Low Temp	High Temp	Low Temp	High Temp
Consumer	[0°C]	[+60°C]	[0°C]	[+100°C]
Automotive	[-40°C]	[+125°C]	[-40°C]	[+105°C]
Under Hood	[-55°C]	[+150°C]	[-65°C]	[+150°C]
Industrial	[-55°C]	[+95°C]	[-50°C]	[+150°C]
Telecomm	[-40°C]	[+85°C]	[-50°C]	[+125°C]
Military	[-55°C]	[+95°C]	[-65°C]	[+150°C]

THERMAL SHOCK: Refers to rapidly moving a test unit from a chamber at high temperature to another chamber at low temperature. The chambers can be air to air, or liquid to liquid. Heat transfer, and stress on the unit, is much higher when the unit is dipped into a liquid. The liquid/liquid test is more severe than the air/air test even if the temperature range is the same.

TGA (Thermogravimetric Analyzer): Measures the weight loss of a Polymer material experiences as it is exposed to increasing temperature. There are three characteristics of the material that are of interest:

1. How much weight loss is there as the material cures (since this loss is almost always a gas, it causes voids if it is high).

2. After curing, if the material is heated above the cure temperature, does it continue to lose weight (an indication that the cure was not complete)?

3. Heat the material to very high temperatures and see at what temperature it begins to deteriorate (when the polymer breaks down it will exhibit significant weight loss).

TMA (Thermal Mechanical Analyzer): Instrument that measures the CTE of a material as a function of temperature. Unlike most common materials, polymer materials exhibit a relatively sharp change in their CTE as the temperature is increased. The temperature at which this change in CTE occurs is referred to as glass transition temperature.

THERMOSET: Polymer material which, once cured remains a solid at all temperatures. Thermosetting materials will remain solid until they char (burn) if the temperature is raised high enough, but they will never become liquid again.

THIXOTROPIC INDEX: Most liquids exhibit constant resistance to force regardless of how fast the force is applied, e.g.- if you stir a glass of water, no matter how fast you stir, the water will resist the force in the same amount (the viscosity does not change). Some materials (such as most polymers) show a decrease in resistance to force if the speed at which the force is applied increases. If you stir a polymer faster, it gets easier to stir (the viscosity decreases). This phenomenon is called Thixotropic behavior. In order to compare materials, a standard test is used which is called the Thixotropic Index. Viscosity is measured at 0.5 RPM and at 5.0 RPM. The ratio of these two measurements is the Thixotropic index. The Thixotropic Index of a material determines how well the material will perform in several key semiconductor packaging applications.

When dispensing die attach adhesive, it is desirable for the material to flow easily from the syringe. The material should stay in place without reflow. This kind of behavior is achieved with a Thixotropic Index of above 5.0

UNDERFILL: When a die is Flip Chip attached, (turned upside down and it's pads are attached with solder or conductive epoxy) the CTE mismatch of the substrate and die can create stress on the joints causing them to fail over time or extended thermal cycling. In order to reduce the stress, a polymer material is flowed or otherwise placed under the flipped die. This material is called underfill. Underfill that flows under the die after it is attached it is called conventional underfill. Underfill that is placed under the die before the die is attached it is called no-flow underfill.

VISCOSITY: The speed of fluid flow and/or the resistance to shear. Usually measured in Centipoise (cps). Water is 1 cps, cooking oil is 200 cps, honey is 50,000 cps peanut butter is 1,000,000 cps.

VOID: Any hole in the encapsulant, die attach adhesive or underfill is called a void. Voids can exist because air is trapped during the dispense and bond process (the hole is 'surrounded' by polymer and gets trapped) or can form because the polymer releases gas during curing. Voids reduce thermal conductivity and, if severe, can reduce adhesion strength. They can also trap moisture and reduce device reliability.

VOLATILES: Any material that evaporates or boils rapidly at the temperatures at which it is used or processed is said to be volatile. Many organic materials which are used as solvents are volatile. If a polymer requires the use of such solvents (because it won't flow without their help) it is said to contain volatile materials. When volatile materials escape, they can create voids and must be processed accordingly.

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Terms and Conditions of Sale

TERMS AND CONDITIONS OF SALES FROM TELEPHONE ORDER, PURCHASE ORDER, WEB SITE ORDER OR CATALOG ORDER

1. ACCEPTANCE Acceptance of Customer's order is limited to the terms and conditions contained herein. Seller hereby notifies and Customer hereby acknowledges that Seller objects to all terms and conditions in any purchase order or any other communications from the Customer which are additional to, different from, or conflicting with the terms and conditions contained herein. Neither the failure of Seller to object to a purchase order or any other communication from the Customer, nor shipment of the Products described herein shall be deemed an acceptance of any terms or conditions which are additional to, different from, or conflicting with the terms and conditions contained herein. The Customer shall be deemed to have accepted all of the terms and conditions contained herein, and no other, upon Customer's acceptance or use of the Products described in this contract.

2. PRICES & MINIMUM ORDER POLICY Prices set forth in this contract are exclusive of all federal, state, excise and similar taxes, including, without limitation, taxes on manufacture, sales, receipts, and all costs of transportation, packaging, insurance and other costs, including export and import duties, if applicable. All such taxes and costs will be added to the invoice as a separate charge and paid by Customer. Prices are based on current costs and therefore subject to change without notice to account for changes in the cost of raw materials and other direct costs beyond Seller's control.

Minimum Order Policy: Orders placed in U.S. Dollars and shipped through Polysciences, Inc.: $35.00. For orders placed in Euros and shipped to European countries through Polysciences Europe GmbH: On orders less than 250.00 Euro, a small order fee of 20.00 Euro will be applied to shipments outside of Germany.

3. SHIPMENT & RISK All sales are freight and insurance prepaid by Customer from Seller's shipping point unless otherwise noted. If shipping and handling charges are quoted or invoiced, they will include charges in addition to actual freight costs. Delivery of the goods to the carrier at Seller's shipping point shall constitute delivery to Customer and Customer shall bear all risk of loss or damage in transit. The general method of shipment for each item is listed in Seller's catalog or website. However, Seller reserves the right, in its discretion, to determine the exact method of shipment. Seller reserves the right to make delivery in installments, all such installments to be separately invoiced and paid for when due per invoice, without regard to subsequent deliveries. Delay in delivery of any installment shall not relieve Customer of it's obligations to accept remaining deliveries. Shipments made thirty (30) days after specified date of delivery, if date is so specified, shall constitute good delivery. Any delivery not in dispute shall be paid for regardless of other controversies relating to other delivered or undelivered Products.

4. DELAYS Seller will not be liable for any damages suffered by Customer by reason of any delay in the performance of this contract, or in the delivery or shipment of the Products, when such delay is directly or indirectly caused by, or in any manner arises from, fires, floods, accidents, acts of terrorists, riots, acts of God, war or insurrection, governmental interference or embargoes (whether by priorities, rationing or otherwise), strikes, labor difficulties, shortages of labor, fuel, power, materials or supplies, transportation delays or any other cause (whether or not similar to any of the foregoing) beyond Seller's control. If any of the above mentioned contingencies occur, Seller reserves the right to cancel in whole or in part, this contract without any resulting liability.

5. TERMS OF PAYMENT & INTEREST Terms of payment are net cash thirty (30) days. All payments shall be made in U.S. dollars. Seller reserves the right to impose a money service charge at the rate of one and one-half percent (1 1/2%) per month on invoices unpaid after thirty (30) days. Any payment terms specified in this contract supersede any inconsistent part of this section. A service fee of 3% will be added to all credit card orders over $5,000.00 USD

6. RAW CHEMICALS Seller reserves the right to select sources of supply for raw chemicals. Seller does not guarantee the compatibility or performance of raw chemicals with any specific customers' Product. This contract is subject to Seller's ability to obtain the necessary raw chemicals. All chemicals should be handled only by qualified individuals trained in procedures and familiar with the potential hazards of the chemicals. The absence of warning must not be interpreted as an indication of safety. All chemicals are offered for research and investigational purposes only and are not intended for food, drug, cosmetic or household use. Buyer assumes all risk and liability for the use and/or results obtained by the use of the Products whether used singly or in combination with other products.

7. LIMITED WARRANTY SELLER GIVES NO WARRANTY AS TO MERCHANTABILITY OR AS TO FITNESS FOR ANY PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION IN THIS CONTRACT OR BEYOND THE TERMS AND CONDITIONS CONTAINED HEREIN. The sole and exclusive warranty provided herein is that the Products sold are warranted to be free from defects in material or workmanship as established by Seller's standards of acceptable quality. This express warranty is in lieu of all other warranties, express or implied. Customer's sole remedy under this warranty is to have its account credited with the invoice amount, or at Seller's sole option to have any Products which contain defects at variance with Seller's specifications replaced, provided the specific defect is reported to Seller within fifteen (15) days after the date of initial shipment. Every such claim under this warranty shall be deemed waived by Customer unless it is made in writing within said fifteen (15) day period. Defective Products may be returned to Seller only after Seller's inspection and then only upon receipt of definite instructions for the return received from Seller, i.e., the Customer must obtain a written Returned Material Authorization number from the Seller. Any Products returned without Seller's advance written instructions will not be received for replacement or credit. Products returned without defect which are approved for return by the Seller are subject to a restocking charge equal to 25% of the purchase price of the subject item.

8. LIMITATION OF LIABILITY UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE TO CUSTOMER OR ANY OTHER PERSON FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, LOSSES OR EXPENSES ARISING FROM THIS CONTRACT OR ITS PERFORMANCE OR IN CONNECTION WITH THE USE OF, OR INABILITY TO USE THE PRODUCTS FOR ANY PURPOSE WHATSOEVER, OR FOR INJURY TO PERSON, OR DAMAGE TO OR LOSS OF PROPERTY OR VALUE CAUSED BY THE PRODUCTS.
Customer agrees to indemnify and hold harmless Seller, its employees, agents, successors, officers, and assigns, from and against any suits, losses, claims, demands, liabilities, costs and expenses (including attorney and accounting fees) that Seller may sustain or incur as a result of any claim against Seller based upon negligence, breach of warranty, strict liability in tort, contract, or any other theory of law brought by Customer, its officers, agents, employees, successors or assigns, by Customer's customers, by end users, by auxiliary personnel (such as freight handles, etc.) or by other third parties, arising out of, directly or indirectly, the use of Seller's Products, or by reason of Customer's failure to perform its obligations contained herein. Customer shall notify Seller in writing within fifteen (15) days of Customer's receipt of knowledge of any accident, or incident involving Seller's Products which results in personal injury or damage to property, and Customer shall fully cooperate with Seller in the investigation and determination of the cause of such accident and shall make available to Seller all statements, reports and tests made by Customer or made available to Customer by others. The furnishing of such information to Seller and any investigation by Seller of such information or incident report shall not in any way constitute any assumption of any liability for such accident or incident by Seller.

NO CLAIM OF ANY KIND, WHETHER AS TO PRODUCTS DELIVERED OR FOR NON-DELIVERY OF PRODUCTS, OR FOR INJURY TO PERSONS OR DAMAGE TO OR LOSS OF PROPERTY OR VALUE CAUSED BY ANY PRODUCTS SOLD HEREUNDER, SHALL BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCTS SUBJECT TO SUCH CLAIMS.

9. INTELLECTUAL PROPERTY RIGHTS Customer assumes all patent, copyright, and trademark liability, except for Seller's stock items. Without limiting the meaning of the foregoing, Customer shall indemnify and hold Seller harmless from and against all loss, cost, claim, expense, or liability for infringement of any letters patent, trademarks or copyrights or otherwise, resulting from or arising in connection with Customer's printed matter, design, shape, specifications or the sale or use of any item covered by this contract, or Seller's compliance with Customer's instructions. Customer shall promptly pay or secure any judgment or recovery which may be obtained against Seller with respect to any claim covered by the foregoing, and will pay Seller reasonable costs and expenses incurred in evaluating, defending and settling such claim in any judicial or administrative proceeding or in any negotiations prior thereto. Customer shall notify the Seller in writing of any claim, demand or suit against Customer brought on the ground that use or resale by Customer, or by anyone purchasing from Customer, of the Products ordered as a result of this contract infringes any patent, trademark, service mark, copyright, trade name, license or other proprietary right of other parties. The Seller shall, at its option, have the right to take control of and defend such claim, demand or suit at Customer's expense, to approve counsel and to hire its own counsel at Customer's expense to participate in such negotiation or litigation.

10. CONFIDENTIALITY Any designs, sketches, formulae, proofs, etc. originated by Seller are submitted in confidence and will not be disclosed by Customer to any third party. Unless otherwise agreed in writing, such items and all copyrights or patents protecting them are owned by Seller.

11. MODIFICATION Modifications, additions, cancellations or suspensions of any order resulting from this contract shall not be effective or binding upon Seller unless evidenced in writing, signed by an authorized manager of both the Customer and the Seller, expressly stating the terms modified and the nature of the modification. This contract supersedes all prior agreements, proposals, arrangements and communications, whether oral or written with respect to this order.

12. JURISDICTION Customer and the Seller, each, to the extent that it may lawfully do so, hereby consents to the jurisdiction of the courts of the Commonwealth of Pennsylvania and the United States District Court for the Eastern District of Pennsylvania for any suit, action, or other proceeding arising out of any of its obligations hereunder or with respect to the transactions contemplated hereby, and expressly waives any and all objections such party may have to venue in any such courts. Each party, to the extent that it may lawfully do so, further agrees that a summons and complaint commencing an action or proceeding in any of such courts shall be properly served and shall confer personal jurisdiction if served personally or by certified mail to it as its address provided in this contract or as otherwise provided under the laws of the Commonwealth of Pennsylvania. This contract and the obligations of the parities hereto, shall be construed in accordance with and all disputes shall be governed by the laws of the Commonwealth of Pennsylvania, U.S.A. (without reference to its conflict of rules), including provisions of the Uniform Commercial Code as adopted by this Commonwealth of Pennsylvania.

13. LIMITATION OF ACTIONS No action regardless of form arising out of any contract with the Customer may be commenced more than one (1) year after the cause of action has accrued except an action for nonpayment. Customer shall reimburse Seller for any attorney's fees and other legal expenses incurred in enforcing or defending its rights under this contract. Unless Customer notifies Seller in writing to the contrary within five (5) days after the receipt of this contract by Customers, the Customer's acceptance of the Products or payment therefore shall be equivalent to Customer's assent to the terms and conditions hereof.

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Periodic Table of the Elements

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H Hydrogen 1.00794																	2 He Helium 4.003
2	3 Li Lithium 6.941	4 Be Beryllium 9.012182											5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.00674	8 O Oxygen 15.9994	9 F Fluorine 18.9984032	10 Ne Neon 20.1797
3	11 Na Sodium 22.989770	12 Mg Magnesium 24.3050											13 Al Aluminum 26.981538	14 Si Silicon 28.0855	15 P Phosphorus 30.973761	16 S Sulfur 32.066	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
4	19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.955910	22 Ti Titanium 47.867	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938049	26 Fe Iron 55.845	27 Co Cobalt 58.933200	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.92160	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.90550	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.760	52 Te Tellurium 127.60	53 I Iodine 126.90447	54 Xe Xenon 131.29
6	55 Cs Cesium 132.90545	56 Ba Barium 137.327	57 La* Lanthanum 138.9055	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.078	79 Au Gold 196.96655	80 Hg Mercury 200.59	81 Tl Thallium 204.3833	82 Pb Lead 207.2	83 Bi Bismuth 208.98038	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)
7	87 Fr Francium (223)	88 Ra Radium (226)	89 Ac** Actinium (227)	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (263)	107 Bh Bohrium (262)	108 Hs Hassium (265)	109 Mt Meitnerium (266)	110 Ds Darmstadtium (269)	111 Rg Roentgenium (272)							

Transition Metals

* Lanthanides
** Actinides

58 Ce Cerium 140.116	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
90 Th Thorium 232.0381	91 Pa Protactinium 231.03588	92 U Uranium 238.0289	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)

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