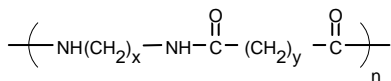


Applications

Engineering Polymers

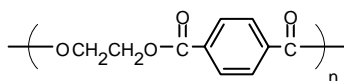
Engineering polymers are materials with exceptional mechanical properties such as stiffness, toughness, and low creep that make them valuable in the manufacture of structural products like gears, bearings, electronic devices, and auto parts.¹⁻³ Typical engineering plastics include acetals, polyamides, poly(amide-imide)s, polyarylates, polycarbonates, polyesters, poly(ether etherketone)s, poly(ether-imide)s, polyimides, poly(phenylene oxide)s, poly(phenylene sulfide)s, and polysulfones.⁴ Aldrich offers polymers in all these classes. Representative examples are shown below.



1

Polyamides are crystalline and have good impact strength, toughness, and abrasion resistance. Eighteen different aliphatic and aromatic polyamides are available. Stabilizers and lubricants are present in some of these products.

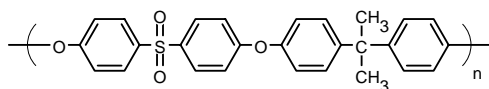
44,299-2	Nylon 4/6 (1)	250g ; 1kg
42,916-3	Nylon 6/6 (Zytel® 101L nylon resin) (1)	250g ; 1kg ; 5kg
18,806-9	Nylon 6/9 (1)	100g ; 250g
42,927-9	Nylon 6/12 (Zytel® 158 nylon resin) (1)	250g ; 1kg ; 5kg
42,924-4	Nylon 6/66 (Zytel® 109L nylon resin) (1)	250g ; 1kg ; 5kg
18,116-1	Nylon 12	5g ; 250g
44,652-1	Poly[N,N'-(1,3-phenylene)isophthalamide]	100g ; 500g



2

Polyesters are often used with fillers like fiberglass, mica, and minerals to increase strength and stiffness.

42,925-2	Poly(ethylene terephthalate) (Rynite® 530 polyester resin), 30% glass reinforced (2)	250g ; 1kg ; 5kg
42,926-0	Poly(ethylene terephthalate) (Rynite® FR530 polyester resin), 30% glass reinforced with added fire retardant (2)	250g ; 1kg ; 5kg
20,025-5	Poly(ethylene terephthalate) (2)	5g ; 250g ; 500g
43,514-7	Poly(1,4-butylene terephthalate), melt index 20	250g ; 1kg
43,515-5	Poly(1,4-butylene terephthalate), melt index 50	250g ; 1kg
43,533-3	Poly(1,4-cyclohexanedimethylene terephthalate-co-ethylene terephthalate)	1kg

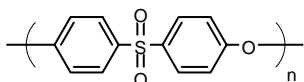


3

Sulfone-containing polymers show high resistance to acids and alkalis.

These thermally stable polymers are used in electronic connectors, circuit boards, sterilizable items, and appliance covers.⁵

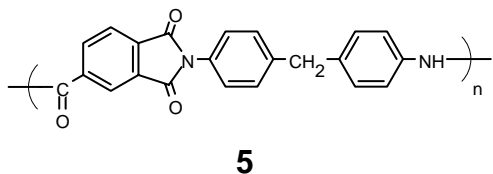
42,830-2	Polysulfone, M_n ca. 16,000 (3)	5g ; 100g ; 500g
18,244-3	Polysulfone, M_n ca. 22,000 (3)	5g ; 250g ; 500g
37,429-6	Polysulfone, M_n ca. 26,000 (3)	20g ; 200g ; 1kg
18,245-1	Polysulfone, secondary standard, typical M_w 67,000 (3)	25g
19,109-4	Poly(1,4-phenylene ether-sulfone), melt index 75 (4)	50g ; 250g
44,097-3	Poly(1,4-phenylene ether-ether-sulfone), powder	250g ; 1kg
44,096-5	Poly(1,4-phenylene ether-ether-sulfone), pellets	250g ; 1kg



4

Applications

Engineering Polymers (continued)



Polyimides have outstanding thermal properties.

30,979-6	Polybenzimidazole	5g ; 25g
42,827-2	Poly(trimellitic anhydride chloride-co-4,4' methylenedianiline) (5)	25g; 100g
45,975-5	Poly(trimellitic anhydride chloride-<i>alt</i>-benzidine), 20 wt. % solution in NMP/xylenes	10mL ; 25mL

Larger quantities of TSCA-listed polymers are available from [Sigma-Aldrich Fine Chemicals](#), the large-scale chemicals division of Sigma-Aldrich, Inc. Please call **800-336-9719 (USA)** or visit our Web site: www.sigma-aldrich.com to inquire about prices and quantities.

References: (1) Alger, M.S.M. *Polymer Science Dictionary*, Elsevier Science: New York, 1989 (Aldrich Cat. No. [Z24,689-1](#)). (2) Seymour, R.B.; Carraher, C.E., Jr. *Polymer Chemistry: An Introduction*, 3rd ed.; Marcel Dekker: New York, 1992; p 243 (Aldrich Cat. No. [Z40,603-1](#)). (3) Odian, G. *Principles of Polymerization*, 3rd ed.; John Wiley & Sons: New York, 1991; p 100 (Aldrich Cat. No. [Z22,195-3](#)). (4) Stevens, M.P. *Polymer Chemistry: An Introduction*, 2nd ed.; Oxford University Press: New York, 1990; p 32 (Aldrich Cat. No. [Z24,576-3](#)). (5) Saunders, K.J. *Organic Polymer Chemistry*, 2nd ed.; Chapman and Hall: New York, 1988; pp 281-285.

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Surfactants

From *Adogen*® to *Zonyl*® and everything in between, Aldrich offers over 150 different surfactants to meet your specific needs. Our wide selection includes ionic, nonionic, and zwitterionic surfactants with hydrophile-lipophile balance (HLB) values of 1.0 to >20. We now also offer the new Triton® SP-series surfactants – the splittable surfactants that cleave at low pH and cease to act as surfactants.

A brief selection is provided below. For more information and a complete listing of Aldrich surfactants, search our Web site at www.sigma-aldrich.com or contact our Technical Services department at **800-231-8327 (USA)** or your local office, or email us: aldrich@sial.com.

49,475-5	Triton® SP-135; HLB = 8	100mL
49,476-3	Triton® SP-190; HLB = 13	100mL
23,472-9	Triton® X-100; HLB = 13.5	5mL; 100mL; 500mL
28,210-3	Triton® X-100, reduced	5g; 25g
23,473-7	Triton® X-405, 70% solution in water; HLB = 17.9	5mL; 100mL; 500mL

85,657-6	Adogen® 464	5mL; 100mL; 500mL
42,053-0	Alkanol® XC surfactant	100g; 500g
46,638-7	Brij® 700; HLB = 18.8	250g; 1kg
27,434-8	Tween® 20; HLB = 16.7	25mL; 500mL; 4L; 18L
27,436-4	Tween® 80; HLB = 15.4	25mL; 500mL; 4L; 18L
42,141-3	Zonyl® FSN fluorosurfactant	50mL; 250mL

46,330-2	Glycolic acid ethoxylate 4-nonylphenyl ether, average M_n ca. 600	100mL
46,329-9	Glycolic acid ethoxylate 4-<i>tert</i>-butylphenyl ether, average M_n ca. 380	100mL
46,322-1	Glycolic acid ethoxylate lauryl ether, average M_n ca. 360	100mL
46,324-8	Glycolic acid ethoxylate lauryl ether, average M_n ca. 460	100mL

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