



MODERN PLASTICS ENCYCLOPEDIA

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MODERN PLASTICS ENCYCLOPEDIA

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Modern Plastics Encyclopedia is published annually by McGraw-Hill Inc., 1221 Ave. of the Americas, New York, NY 10020. Executive, editorial, and advertising offices, 1221 Ave. of the Americas, New York, NY 10020. Phone

212-512-2000. Teletype: TWX-710-581-4879. Cable: McGraw-Hill, N.Y. Please mail all circulation correspondence, subscription orders, and change of address notices to: Modern Plastics, Fulfillment Mgr., P.O. Box 1488, Riverton, NJ 08077. Modern Plastics has no connection with any company of similar name. Modern Plastics Encyclopedia printed in U.S.A. Modern Plastics issued monthly, 1221 Ave. of the Americas, New York, NY. Modern Plastics Encyclopedia issue published as second issue in October. Modern Plastics Encyclopedia is distributed to Modern Plastics subscribers as part of subscription service. Modern Plastics subscription rates (including Modern Plastics Encyclopedia issue) for manufacturing, engineering, and R & D companies, also government and schools, in the U.S. and its possessions, 1 year \$32, 2 years \$48, 3 years \$66; in Canada, 1 year \$CDN 48, 2 years \$CDN 73, 3 years \$CDN 99. Rates for other companies in the U.S. and its possessions \$38 per year; Canada \$CDN 60 per year. Single copies (except for Encyclopedia issues) \$5 each, \$CDN 6. For subscriber service, call collect 609-786-1735 in the U.S. except Alaska and Hawaii. The name 'Modern Plastics' is Registered (R), U.S. Patent Office. Contents copyrighted (C) 1986 by McGraw-Hill Inc. All rights reserved.

MOPLAY 63 (10A) 1-886 (1986)

Resins and compounds (Cont'd)

Materials	Properties	ASTM test method	Polystyrene and styrene copolymers (Cont'd)		Polyurethane (see also Thermoplastic elastomers)				
			Styrene methyl methacrylate	EMI shielding (conductive); 20% PAN carbon fiber	Thermoset			Thermoplastic	
					Casting resins		50-65% mineral-filled potting and casting compounds	10-20% glass fiber-reinforced molding compounds	EMI shielding (conductive); 30% PAN carbon fiber
					Liquid	Unsaturated			
Processing	1. Melting temperature, °C. T _m (crystalline) T _g (amorphous)				Thermoset	Thermoset	Thermoset		
	2. Processing temperature range, °F. (C = compression; T = transfer; I = injection; E = extrusion)		I: 375-475	I: 430-500	C: 185-250		25 (casting)	I: 360-410	I: 410-450
	3. Molding pressure range, 10 ³ p.s.i.		5-20		0.1-5			8-11	
	4. Compression ratio		2.5-3.5						
	5. Mold (linear) shrinkage, in./in.	D955	0.002-0.006	0.0005-0.003	0.020			0.001-0.002	0.007-0.010
Mechanical	6. Tensile strength at break, p.s.i.	D638 ^b	8100-9700	14,000	175-10,000	10,000-11,000	1000-7000	4800-6500	13,000
	7. Elongation at break, %	D638 ^b	2.1-3.0	1	100-1000	3-6	5-55	3-48	20
	8. Tensile yield strength, p.s.i.	D638 ^b							
	9. Compressive strength (rupture or yield), p.s.i.	D695			20,000			5000	
	10. Flexural strength (rupture or yield), p.s.i.	D790	14,500-15,800	20,700	700-4500	19,000		5500-6200	9000
	11. Tensile modulus, 10 ³ p.s.i.	D638 ^b	440-500	2000	10-100			0.95-1.40	500
	12. Compressive modulus, 10 ³ p.s.i.	D695	440-480		10-100				
	13. Flexural modulus, 10 ³ p.s.i.	73° F. D790 200° F. D790 250° F. D790 300° F. D790		1900	10-100	610		90	500
	14. Izod impact, ft.-lb./in. of notch (1/8-in. thick specimen)	D256A	0.2-0.3	0.7	25 to flexible	0.4		14-No break	10
	15. Hardness	Rockwell D785 Shore/Barcol D2240/D2583	M72-80					R45-55	
Thermal	16. Coef. of linear thermal expansion, 10 ⁻⁶ in./in./°C.	D696	40-72		100-200		71-100	34	
	17. Deflection temperature under flexural load, °F.	264 p.s.i. D648 66 p.s.i. D648	205-210	220	Varies over wide range	190-200		115-130	180
	18. Thermal conductivity, 10 ⁻⁴ cal.-cm./sec.-cm. ² -°C.	C177			5		6.8-10		
Physical	19. Specific gravity	D792	1.09-1.13	1.14	1.03-1.5	1.05	1.37-2.1	1.22-1.36	1.33
	20. Water absorption (1/8-in. thick specimen), %	24 hr. D570 Saturation D570	0.11-0.15	0.1	0.2-1.5	0.1-0.2	0.06-0.52	0.4-0.55	1.5
	21. Dielectric strength (1/8-in. thick specimen), short time, v./mil	D149			300-500		500-750 @ 1/16 in.	600	
Design and performance properties For more information on performance and design properties of plastics, see the following charts: Dielectric loss properties p. 552 Dimensional stability p. 585 Environmental stress-crack resistance p. 597 Fatigue p. 614 Film and sheet p. 547 Optical properties p. 611 Outdoor exposure resistance p. 620 Poisson's ratio p. 609 Stress relaxation p. 634 In the 1985-1986 edition of MPE, see: Creep p. 492 Electromagnetic shielding p. 528 Foams p. 486 Impact resistance p. 513 Laminates, by NEMA grades p. 489 In the 1984-1985 edition of MPE, see: Chemical resistance p. 482 In the 1981-1982 edition of MPE, see: Flammability p. 564 In the 1980-1981 edition of MPE, see: Specifications/materials p. 597 Temperature index p. 632		SUPPLIERS ^a	Richardson	Wilson-Fiberfil	Dow Chem. (see ad, p. 53); Conap; Emerson & Cuming; Hexcel; Hysol; Thermoset Plastics; Union Carbide	Dow Chem. (see ad, p. 53); Emerson & Cuming; Thermoset Plastics	Conap; Emerson & Cuming; Thermoset Plastics	LNP; RTP; Thermofil; Union Carbide; Wilson-Fiberfil	Wilson-Fiberfil

a—Boldface listings identify advertisers in this issue. Where advertisements relate to the particular materials described, reference to the page number is included. See the Directory

b—Tensile test method varies with material: D638 is standard for thermoplastics; D882 for thin plastics; D412 for elastomeric plastics; D412 for elastomeric plastics; D412 for elastomeric plastics and thermoplastic components were used.