

Property comparison and ranking guide

Eastman clear medical grade plastics



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Physical comparison	ASTM test method	DuraStar™ polymers			Easter™ copolyester			
		MN611	MN621	MN631	MN058	MN021	MN211	
Physical properties								
Clarity								
Haze (%)	D1003	0.3	0.3	<1	<1	1	0.3	
Transmittance (%)	D1003	91	91	92	82	84	91	
Izod impact strength, notched @ 23°C (73°F), J/m (ft-lbf/in.)	D256	80 (1.5)	370 (7.0)	80 (1.5)	51 (1.0)	40 (0.8)	101 (1.9)	
Flexural modulus, MPa (10 ⁵ psi)	D790	2000 (2.9)	1900 (2.8)	1900 (2.7)	2400 (3.5)	2500 (3.6)	2100 (3.0)	
Elongation @ break (%)	D638	300	310	270	90	120	110	
Tensile stress @ break, MPa (psi)	D638	51 (7400)	53 (7700)	43 (6300)	24 (3500)	25 (3600)	28 (4100)	
Tensile stress @ yield, MPa (psi)	D638	47 (6900)	46 (6700)	50 (7200)	58 (8400)	58 (8400)	50 (7300)	
Heat deflection temperature @ 0.455 MPa (66 psi), °C (°F)	D648	74 (165)	73 (164)	70 (163)	69 (156)	69 (156)	70 (158)	
Heat deflection temperature @ 1.82 MPa (264 psi), °C (°F)	D648	65 (149)	65 (149)	66 (150)	63 (145)	65 (149)	63 (145)	
Specific gravity	D792	1.20	1.20	1.19	1.33	1.33	1.27	
Vicat softening point, °C (°F)	D1525	—	—	86 (186)	80 (176)	—	85 (185)	
Thermal glass transition temperature, T _g , °C (°F)	—	87 (189)	87 (189)	87 (189)	80 (176)	80 (176)	81 (178)	
Barrier								
Oxygen	—							
Water	—							
Processing								
Drying temperature, °C (°F)	—	71 (160)	70 (160)	70 (160)	160 (320)	150–160 (300–320)	71 (160)	
Drying time, hrs	—	3–4	3	4	4–6	4–6	4–6	
Melt temperature, °C (°F)	—	232–277 (450–530)	250–290 (480–550)	230–280 (450–530)	277–293 (530–560)	275–295 (530–565)	249–271 (480–520)	
Mold temperature, °C (°F)	—	16–38 (60–100)	15–30 (60–80)	15–30 (60–80)	16–32 (60–90)	10–30 (50–90)	16–38 (60–100)	
Injection speeds	—	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	
Product summary								
Sterilization								
Gamma	—							
EtO	—							
E-beam	—							
Gas plasma	—							
Autoclave	—							
Joining								
Solvent bonding	—							
Ultrasonic bonding	—							
Laser welding	—							
Adhesives	—							
Swaging (cold bending)	—							
Radio frequency welding	—							
Thermal bonding	—							
Process								
Injection molded	—							
Extrusion blow molded	—							
Injection blow molded	—							

Injection molded properties											
rs		Eastman Tritan™ copolyester			Eastman Provista™ copolymer	Tenite™ cellulotics			Ecdel™ elastomers		
MN006	MB002	MX711	MX731	MX811	MP002	350A-14 ^a	360A-7	360A-16	9965	9966	9967
<1.0	1.3	<1	<1	<1	1.3	<8.5	<8.5	<8.5	1 ^b	1 ^b	1 ^b
92	91	90	91	92	91	>90	>90	>90	93 ^b	93 ^b	94 ^b
NB ^c	NB ^c	980 (18.4)	860 (16.1)	650 (12.2)	NB ^c	416 (7.8)	203 (3.8)	>533 (>10)	NB ^c	NB ^c	NB ^c
1800 (2.6)	1900 (2.7)	1550 (2.25)	1575 (2.28)	1585 (2.28)	1900 (2.7)	1517 (2.2)	1862 (2.7)	1241 (1.8)	150 (2.2)	150 (2.2)	150 (2.2)
330	300	210	210	140	300	40	50	45	300	400	400
54 (7800)	48 (7000)	53 (7700)	52 (7500)	53 (7700)	48 (7000)	37 (5300)	41 (5900)	30 (4400)	20 (2900)	22 (3200)	23 (3300)
44 (6300)	47 (6900)	43 (6200)	43 (6200)	44 (6400)	47 (6900)	32 (4600)	41 (6000)	27 (3900)	14 (2030)	14 (2030)	13 (1900)
73 (163)	73 (163)	99 (210)	94 (201)	109 (228)	73 (163)	84 (183)	92 (198)	80 (176)	58 (136)	58 (136)	58 (136)
64 (147)	63 (145)	85 (185)	81 (178)	92 (198)	63 (145)	76 (169)	82 (180)	72 (162)	46 (115)	44 (111)	42 (108)
1.23	1.25	1.18	1.18	1.17	1.25	1.20	1.21	1.19	1.13	1.13	1.13
88(190)	85 (185)	—	—	—	85 (185)	100 (212)	107 (225)	92 (198)	170 (338)	170 (338)	170 (338)
85 (185)	85 (185)	110 (212)	110 (212)	120 (248)	85 (185)	110 (230)	118 (244)	97 (207)	−3 (27)	−3 (27)	−3 (27)
71 (160)	70 (160)	88 (190)	88 (190)	88 (190)	70 (160)	70 (160)	70 (160)	70 (160)	65 (150)	65 (150)	65 (150)
6	4–6	4–6	4–6	4–6	4–6	4	4	4	4	4	4
249–271 (480–520)	220–235 (430–450)	260–282 (500–540)	260–282 (500–540)	260–282 (500–540)	210–225 (415–440)	200–225 (390–430)	200–225 (390–430)	200–225 (390–430)	225–260 (435–500)	225–260 (435–500)	225–260 (435–500)
16–38 (60–100)	5–32 (40–90)	38–66 (100–150)	38–66 (100–150)	38–66 (100–150)	15–40 (60–100)	55–60 (130–140)	55–60 (130–140)	55–60 (130–140)	50–80 (120–180)	50–80 (120–180)	50–80 (120–180)
slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate	slow to moderate



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Material Safety Data Sheets providing safety precautions that should be observed when handling and storing Eastman products are available online or by request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

It is the responsibility of the medical device manufacturer ("Manufacturer") to determine the suitability of all component parts and raw materials, including any Eastman product, used in its final product to ensure safety and compliance with requirements of the United States Food and Drug Administration (FDA) or other international regulatory agencies.

Eastman products have not been designed for nor are they promoted for end uses that would be categorized either by the United States FDA or by the International Standards Organization (ISO) as implant devices. Eastman products are not intended for use in the following applications: (1) in any bodily implant applications for greater than 30 days, based on FDA-Modified ISO-10993, Part 1, "Biological Evaluation of Medical Devices" tests (including any cosmetic, reconstructive, or reproductive implant applications); (2) in any cardiac prosthetic device application, regardless of the length of time involved, including, without limitation, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass assisted devices; or (3) as any critical component in any medical device that supports or sustains human life.

For manufacturers of medical devices, biological evaluation of medical devices is performed to determine the potential toxicity resulting from contact of the component materials of the device with the body. The ranges of tests under FDA-Modified ISO-10993, Part 1, "Biological Evaluation of Medical Devices" include cytotoxicity, sensitization, irritation or intracutaneous reactivity, systemic toxicity (acute), subchronic toxicity (subacute), implantation, and hemocompatibility. For Eastman products offered for the medical market, limited testing information is available on request. The Manufacturer of the medical device is responsible for the biological evaluation of the finished medical device.

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