EASTMAN

Technical Data Sheet

Eastar™ Copolyester DN004 Natural

Applications

- Appliances (food contact)
- Color cosmetics packaging
- Consumer housewares-nfc
- Fragrance packaging
- Large appliances non-food contact
- Ophthalmics
- Personal care & cosmetics packaging
- Sporting equipment

Key Attributes

- Chemical resistance to most medical solvents including lipids and IPA
- Gamma and E-beam color stability

Product Description

Eastar™ copolyesters are brilliantly clear polymers that have excellent impact strength, chemical resistance, dimensional stability, and low shrinkage rates. Eastar™ DN004 copolyesters are the toughest materials for the cosmetics and personal care packaging applications. It's very shatter resistant and offers excellent chemical resistance. DN004 contains a mold release.

This product has been GREENGUARD INDOOR AIR QUALITY CERTIFIED
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Typical Properties

Property[a]	Test Method[b]	Typical Value, Units[c]
General		
Specific Gravity	D 792	1.23
Water Absorption, 24 h immersion	D 570	0.13 %
	ISO 62	0.13 %
Mold Shrinkage		
Parallel to Flow, 3.2-mm (0.125-in.) thickness	D 955	0.002-0.005 mm/mm (0.002-0.005 in./in.)
Density	ISO 1183	1.23 g/cm^3
Electrical Properties		
Dielectric Constant		
1 kHz	D 150	2.9
1 MHz	D 150	2.8
Dissipation Factor		
1 kHz	D 150	0.003
1 MHz	D 150	0.013
Arc Resistance	D 495	138 sec
Volume Resistivity	D 257	10^{15} ohm·cm
Surface Resistivity	D 257	10^{16} ohms/square
Dielectric Strength, Short Time, 500	D 149	16.3 kV/mm (415 V/mil)

V/sec rate-of-rise		
High Voltage Arc Tracking Rate	UL 746A	0 mm/min (0 in./min)
Comparative Tracking Index	D 3638	>600 V
Mechanical Properties		
Tensile Stress @ Yield	D 638	45 MPa (6500 psi)
	ISO 527	46 MPa
Tensile Stress @ Break	D 638	52 MPa (7600 psi)
	ISO 527	47 MPa
Elongation @ Yield	D 638	5 %
	ISO 527	4.4 %
Elongation @ Break	D 638	330 %
	ISO 527	230 %
Tensile Modulus	D 638	1800 MPa (2.6 x 10^5 psi)
Flexural Modulus	D 790	1800 MPa (2.6 x 10^5 psi)
	ISO 178	1800 MPa
Flexural Yield Strength	D 790	66 MPa (9600 psi)
	ISO 178	63 MPa
Rockwell Hardness, R Scale	D 785	105
Izod Impact Strength, Notched		
@ 23°C	ISO 180	125 kJ/m^2
@ 23°C (73°F)	D 256	NB
@ -40°C	ISO 180	7.4 kJ/m^2
@ -40°C (-40°F)	D 256	64 J/m (1.2 ft·lbf/in.)
Impact Strength, Unnotched		
@ 23°C (73°F)	D 4812	NB
@ -40°C (-40°F)	D 4812	NB
Impact Resistance (Puncture), Energy @ Max. Load		
@ 23°C (73°F)	ISO 6603-2	14 J
@ -40°C (-40°F)	ISO 6603-2	16 J
Optical Properties		
Haze	D 1003	<1.0 %
Regular Transmittance	D 1003	87 %
Total Transmittance	D 1003	89 %
Thermal Properties		
Deflection Temperature		
@ 0.45 MPa	ISO 75	74 °C
@ 0.455 MPa (66 psi)	D 648	74 °C (165 °F)
@ 1.80 MPa	ISO 75	65 °C
@ 1.82 MPa (264 psi)	D 648	64 °C (147 °F)
Vicat Softening Temperature		
@ 1 kg load	D 1525	88 °C (190 °F)
@ 1 kg load	ISO 306	88 °C
@ 5 kg load	ISO 306	79 °C
Thermal Conductivity	C 177	0.19 W/m·K (1.3 Btu·in./h·ft^2·°F)
Specific Heat		
@ 240°C (464°F)	DSC	2.05 kJ/kg·K (0.49 Btu/lb·°F)
@ 60°C (140°F)	DSC	1.34 kJ/kg·K (0.32 Btu/lb·°F)
UL Flammability Classification		
1.6 mm (0.0625 in.) specimen	UL 94	94HB
3.2 mm (0.125 in.) specimen	UL 94	94HB
Typical Processing Conditions		
Drying Temperature		71 °C (160 °F)
Drying Time		6 hrs
Processing Melt Temperature		250-270 °C (480-520 °F)
Mold Temperature		15-40 °C (60-100 °F)

[a]*Unless noted otherwise, all tests are run at 23°C (73°F) and 50% relative humidity.*
[b]*Unless noted otherwise, the test method is ASTM.*
[c]*Units are in SI or US customary units.*

General

All ISO tests are run @ 4-mm thickness with the exception of Impact Resistance, which is run @ 2-mm thickness.

Comments

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform to the values given.

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