EASTMAN

Technical Data Sheet

Eastman™ Copolyester 1223

Applications

- Deoderant containers
- Electronic packaging
- Multi-layer film non food contact
- Personal care & cosmetics packaging
- Profiles
- Shrink film non food contact
- Signs
- Sporting equipment
- Transaction cards
- Wood furniture

Key Attributes

- Easy primary & secondary operations
- Excellent clarity
- Excellent toughness
- Gamma, ebeam, ETO sterilization stable

Product Description

Eastman™ copolyester 1223 is a clear, amorphous material. Because of its clarity, toughness and good melt strength at processing temperatures, it is useful in a variety of processing techniques including film and sheet extrusion. Eastman™ Copolyester 1223 may be colored using color concentrates, dry colors or liquid colorants.

Typical Properties

Property[a]	Test Method[b]	Typical Value, Units[c]
Electrical Properties		
Dielectric Constant		
1 kHz	D 150	2.6
1 MHz	D 150	2.4
Dissipation Factor		
1 kHz	D 150	0.005
1 MHz	D 150	0.02
Arc Resistance	D 495	158 sec
Volume Resistivity	D 257	10^{15} ohm·cm
Surface Resistivity	D 257	10^{16} ohms/square
Dielectric Strength, Short Time, 500 V/sec rate-of-rise	D 149	16 kV/mm (410 V/mil)
Film Properties		
Thickness of Film Tested	D 374	250 Microns (10 mils)
Density	D 1505	1.27 g/cm^3
Haze	D 1003	0.8 %
Gloss		
@ 45°	D 2457	108
Transparency	D 1746	85 %
Regular Transmittance	D 1003 Modified	89 %
Total Transmittance	D 1003 Modified	91 %
Water Vapor Transmission Rate[d]	F 1249	7 g/m^2·24h (0.5 g/100$in.^2$·24h)
Gas Permeability, CO_2	D 1434	49 cm^3·mm/m^2·24h·atm (125 cm^3·mil/100$in.^2$·24h·atm)
Gas Permeability, O_2	D 3985	10 cm^3·mm/m^2·24h·atm (25 cm^3·mil/100$in.^2$·24h·atm)
Elmendorf Tear Resistance		13.7 N (1400 gf)

M.D.	D 1922	
T.D.	D 1922	16.7 N (1700 gf)
PPT Tear Resistance		
M.D.	D 2582	93 N (21 lbf)
T.D.	D 2582	93 N (21 lbf)
Tear Propagation Resistance, Split Tear Method		
@ 254 mm/min (10 in./min)	D 1938	36 N/mm (205 lbf/in.)
M.D.		
@ 254 mm/min (10 in./min) T.D.	D 1938	36 N/mm (205 lbf/in.)
Tear Resistance, Trouser @ 200 mm/min		
M.D.	ISO 6383-1	36 N/mm (205 lbf/in.)
T.D.	ISO 6383-1	36 N/mm (205 lbf/in.)
Tensile Strength @ Yield		
M.D.	D 882	52 MPa (7500 psi)
T.D.	D 882	52 MPa (7500 psi)
Tensile Strength @ Break		
M.D.	D 882	59 MPa (8600 psi)
T.D.	D 882	55 MPa (8000 psi)
Elongation @ Yield		
M.D.	D 882	4 %
T.D.	D 882	4 %
Elongation @ Break		
M.D.	D 882	400 %
T.D.	D 882	400 %
Tensile Modulus		
M.D.	D 882	1900 MPa (2.8 x 10^5 psi)
T.D.	D 882	1900 MPa (2.8 x 10^5 psi)
Dart Impact[e]		
@ -18°C (0°F)	D 1709A Modified	500 g
@ 23°C (73°F)	D 1709A Modified	400 g
Mechanical Properties (Injection Molded), ASTM Method		
Specific Gravity	D 792	1.27
Water Absorption, 24 h immersion	D 570	0.13 %
Tensile Stress @ Break	D 638	28 MPa (4100 psi)
Tensile Stress @ Yield	D 638	50 MPa (7300 psi)
Elongation @ Break	D 638	130 %
Tensile Modulus	D 638	2100 MPa (3.0 x 10^5 psi)
Flexural Modulus	D 790	2100 MPa (3.0 x 10^5 psi)
Flexural Yield Strength	D 790	70 MPa (10200 psi)
Rockwell Hardness, R Scale	D 785	106
Izod Impact Strength, Notched		
@ 23°C (73°F)	D 256	101 J/m (1.9 ft·lbf/in.)
@ -40°C (-40°F)	D 256	37 J/m (0.7 ft·lbf/in.)
Impact Strength, Unnotched[f]		
@ -20°C (-4°F)	D 4812	NB
@ 23°C (73°F)	D 4812	NB
@ -30°C (-22°F)	D 4812	NB
@ -40°C (-40°F)	D 4812	NB
Impact Resistance (Puncture), Energy @ Max. Load		
2.5-mm (0.100-in.) Thick	D 3763	28 J (21 ft·lbf)
Plaques, @ 23°C (73°F)		
2.5-mm (0.100-in.) Thick	D 3763	41 J (30 ft·lbf)
Plaques, @ -40°C (-40°F)		
3.2-mm (0.125-in.) Thick	D 3763	33 J (24 ft·lbf)
Plaques @ 23°C (73°F)		
3.2-mm (0.125-in.) Thick	D 3763	50 J (37 ft·lbf)

Plaques @ -40°C (-40°F)		
Mechanical Properties (Injection Molded), ISO Method		
Density	ISO 1183, Method D	1.27 g/cm^3
Water Absorption, 24 h immersion	ISO 62	0.13 %
Tensile Stress @ Break	ISO 527	28 MPa
Tensile Stress @ Yield	ISO 527	50 MPa
Elongation @ Break	ISO 527	100 %
Tensile Modulus	ISO 527	2100 MPa
Flexural Modulus	ISO 178	2000 MPa
Flexural Yield Strength	ISO 178	68 MPa
Rockwell Hardness, R Scale	ISO 2039-2	109
Izod Impact Strength, Notched, Type 1 Specimen, Type A Notch		
@ 23°C	ISO 180	6.2 kJ/m^2
@ -40°C	ISO 180	4.2 kJ/m^2
Impact Strength, Unnotched, Type 1 Specimen[g]		
@ -20°C	ISO 180	NB kJ/m^2
@ 23°C	ISO 180	NB kJ/m^2
@ -30°C	ISO 180	NB kJ/m^2
@ -40°C	ISO 180	NB kJ/m^2
Impact Resistance (Puncture), Energy @ Max. Load[h]		
2.5-mm Thick Plaques @ 23°C	ISO 6603-2	40 J
2.5-mm Thick Plaques @ -40°C	ISO 6603-2	35 J
3.2-mm Thick Plaques @ 23°C	ISO 6603-2	44 J
3.2-mm Thick Plaques @ -40°C	ISO 6603-2	36 J
Thermal Properties		
Deflection Temperature		
@ 0.455 MPa (66 psi)	D 648	70 °C (158 °F)
@ 1.82 MPa (264 psi)	D 648	64 °C (147 °F)
Vicat Softening Temperature	D 1525	85 °C (185 °F)
Thermal Conductivity	C 177	0.21 W/m·K (1.5 Btu·in./h·ft^2·°F)
Glass Transition Temperature (T_g)	DSC	80 °C (176 °F)
Specific Heat		
@ 100°C (212°F)	DSC	1.76 kJ/kg·K (0.42 Btu/lb·°F)
@ 150°C (302°F)	DSC	1.88 kJ/kg·K (0.45 Btu/lb·°F)
@ 200°C (392°F)	DSC	1.97 kJ/kg·K (0.47 Btu/lb·°F)
@ 250°C (482°F)	DSC	2.05 kJ/kg·K (0.49 Btu/lb·°F)
@ 60°C (140°F)	DSC	1.30 kJ/kg·K (0.31 Btu/lb·°F)
Coefficient of Linear Thermal Expansion[i]	D 696	5.1 x 10^{-5} /°C (mm/mm·°C) (2.8 x 10^{-5} /°F (in./in.·°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.*
[d] *Test conducted at 38°C (100°F) and 100% relative humidity.*
[e] *12.7 mm (0.5 in.) dia. head, 127 mm (5 in.) dia. clamp, 660 mm (26 in.) drop*
[f] *Nonbreak as defined by ASTM D 4812 with 3.2-mm specimens.*
[g] *Nonbreak as defined by ISO 180 with 4-mm specimens.*
[h] *Testing based on ISO 6603-2 using a striker diameter of 20 mm, a support and clamp diameter of 40 mm, and a velocity of 4.1 m/s.*
[i] *-30°C to 40°C (-22°F to 104°F)*

Comments

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

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