EASTMAN

Technical Data Sheet

Drystar ™ 0601 Copolyester

Applications

- Packaging components non food contact
- Personal care & cosmetics packaging

Product Description

Eastman is pleased to announce the launch of DRYSTAR* copolyesters. This new product-line is designed to meet the needs of converters seeking value-added solutions to their drying requirements of copolyesters. Eastman's copolyesters are highly valued for their excellent balance of properties such as superior aesthetics, impact strength, and chemical resistance. These properties can be optimally realized when the resins are properly dehydrated in accordance to recommended drying conditions and equipment.

Recognizing this value, Eastman conceived Drystar™ copolyesters to allow converters with limited access to desiccant dryers to achieve these optimizations. In addition, some converters with desiccant dryers may still find Drystar™ copolyesters value-adding to attain production flexibility and cost saving by removing the drying process prior to injection molding, profile extruding, or extrusion blow molding copolyesters. The initial launch comprises of the commercialization of four grades of Drystar™ copolyesters and Eastman has on-going program to extend this strategic product-line in the future.

*DRYSTAR is only available in the Asia Pacific Region.

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		
Inherent Viscosity[d]		
(film)	EMN-A-AC-G-V-1	0.70
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[e]	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		
M.D.	D 1922	13.7 N (1400 gf)
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) M.D.	D 1938	36 N/mm (205 lbf/in.)
@ 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[f]		
@ -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[g]		
@ -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 Plaques, @ 23°C (73°F)	D 3763	28 J (21 ft·lbf)
2.5-mm (0.100-in.) Thick Plaques, @ -40°C (-40°F)	D 3763	41 J (30 ft·lbf)
3.2-mm (0.125-in.) Thick Plaques @ 23°C (73°F)	D 3763	33 J (24 ft·lbf)
3.2-mm (0.125-in.) Thick Plaques @ -40°C (-40°F)	D 3763	50 J (37 ft·lbf)
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[h]		
@ -20°C	ISO 180	NB
@ 23°C	ISO 180	NB
@ -30°C	ISO 180	NB
@ -40°C	ISO 180	NB
Impact Resistance (Puncture), Energy @ Max. Load[i]		
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[j]	D 696	5.1 x 10^{-5} /°C (mm/mm·°C) (2.8 x 10^{-5} /°F (in./in.·°F))
Typical Processing Conditions		
Drying Temperature[k]		70 °C (160 °F)
Drying Time[k]		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.*

[d]*The inherent viscosity of pellets is typically 0.75.*

[e]*Test conducted at 38°C (100°F) and 100% relative humidity.*

[f]*12.7 mm (0.5 in.) dia. head, 127 mm (5 in.) dia. clamp, 660 mm (26 in.) drop*
[g]*Nonbreak as defined by ASTM D 4812 with 3.2-mm specimens.*
[h]*Nonbreak as defined by ISO 180 with 4-mm specimens.*
[i]*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.*
[j]*-30°C to 40°C (-22°F to 104°F)*
[k]*Drying is only recommended for products previously opened and exposed to humid conditions.*

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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