EASTMAN

Technical Data Sheet
Eastar™ Copolyester 6763

Applications

- Flexible medical device packaging
- Pharmaceutical packaging
- Rigid medical packaging

Key Attributes

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

Product Description

Meets ISO 10993 and/or USP Class VI biocompatibility requirement; Food Contact Status compliant.
Eastar™ 6763 copolyester is a clear, amorphous material that can be molded and extruded with ease. Its excellent performance properties include clarity, toughness, good melt strength, no dusting, no stress whitening, good heat sealability, easy cutting and thermoforming. Eastar 6763 may be colored using color concentrates, dry colors, or liquid colorants. Eastar 6763 can be safely sterilized with proper ethylene oxide, radiation, or electron beam methods without property loss or color shift. It is well suited for a variety of applications including, medical packaging, cosmetics and personal care packaging, food and beverage packaging, and display & signs.

In medical applications Eastar 6763 provides:

- Superior, long-term clarity provides easy identification of instruments
- Excellent puncture resistance and impact toughness ensure package integrity
- Excellent ability to be subjected to several methods of sterilization, providing flexibility and security to the device manufacturer
- Excellent optical and physical property stability post sterilization
- Good melt strength offers wide processing latitude and ease in thermoforming

The production and trimming of rigid medical trays made from sheet of Eastar 6763 results in little or no dust or particulates. After the thermoformed trays are made, they are put in polybags. The polybags of trays are then placed in protective boxes for storage or shipment. As long as the polybags in the protective boxes are intact and no outside contamination is evident, the thermoformer or medical device manufacturer should not need to clean the tray prior to packaging a device and sealing the package. If contamination is found on the medical trays and cleaning is required, use a lint-free towel. Blowing the tray out with filtered, deionized, non-lubricated air is also acceptable, assuming this does not stir up dust from the surrounding area. Using alcohol, which could cause crazing, or water, which would not evaporate, is not recommended.

This product has been *CRADLE TO CRADLE CERTIFIED*™ Bronze, with Material Health Certificate, Platinum.
The *CRADLE TO CRADLE CERTIFIED* mark is a registered certification mark used under license through the Cradle to Cradle Products Innovation Institute, a nonprofit organization that administers the publicly available *Cradle to Cradle Certified*™ Product Standard which provides designers and manufacturers with criteria and requirements for continually improving product materials and manufacturing processes. The *Cradle to Cradle Certified*™ Product Standard guides designers and manufacturers through a continual improvement process that looks at a product through five quality categories—material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. A product receives an achievement level in each category—Basic, Bronze, Silver, Gold, or Platinum—with the lowest achievement level representing the product's overall mark.

The Material Health Certificate provides manufacturers with a trusted way to communicate their efforts to identify and replace chemicals of concern in their products. For more information about Cradle to Cradle certification and to obtain printable certificates for Eastman copolyesters, visit www.c2ccertified.org . Search for Eastman Chemical Company in *Cradle to Cradle Certified* Products Registry.

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[e]	F 1249	7 g/m^2·24h (0.5 g/100in.^{2}·24h)
Gas Permeability, CO_2	D 1434	49 cm^3·mm/m^2·24h·atm (125 cm^3·mil/100in.^{2}·24h·atm)
Gas Permeability, O_2	D 3985	10 cm^3·mm/m^2·24h·atm (25 cm^3·mil/100in.^{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[i]		500 g

@ -18°C (0°F)	D 1709A Modified	
@ 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[f]		
@ -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[d]	D 696	5.1 x 10^{-5} /°C (mm/mm·°C) (2.8 x 10^{-5} /°F (in./in.·°F))
Typical Processing Conditions		
Mold Temperature		16-38 °C (60-100 °F)
Processing Melt Temperature		249-271 °C (480-520 °F)
Drying Time		4-6 hrs
Drying Temperature		65 °C (150 °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]*-30°C to 40°C (-22°F to 104°F)*
[e]*Test conducted at 38°C (100°F) and 100% relative humidity.*
[f]*Nonbreak as defined by ISO 180 with 4-mm specimens.*
[g]*Nonbreak as defined by ASTM D 4812 with 3.2-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]*12.7 mm (0.5 in.) dia. head, 127 mm (5 in.) dia. clamp, 660 mm (26 in.) drop*

Eastman Medical Disclaimer

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 in order to ensure safety and compliance with requirements of the United States Food and Drug Administration (FDA) or other international regulatory agencies.

Eastman Chemical Company products have not been designed for nor are they promoted for end uses that would be categorized by either 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.

Eastman Chemical Company products offered for the medical market have met selected FDA-Modified ISO-10993, Part 1 "Biological Evaluation of Medical Devices" tests with human tissue contact time of 30 days or less. The tests include: cytotoxicity, sensitization, irritation or intracutaneous reactivity, systemic toxicity (acute), subchronic toxicity (sub-acute), implantation, hemocompatibility. The Manufacturer is responsible for the biological evaluation of the finished medical device.

The suitability of an Eastman Product in a given end-use environment is dependent upon various conditions including, without limitation, chemical compatibility, temperature, part design, sterilization method, residual stresses, and external loads. It is the responsibility of the Manufacturer to evaluate its final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

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.

and safety of your employees and purchasers of your products. No warranty is made of the merchantability of fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

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