



Eastar™ 6763

Eastman Chemical Company - Copolyester

Wednesday, December 8, 2021

General Information

Product Description

Eastar™ 6763 copolyester meets ISO 10993 and/or USP Class VI biocompatibility requirement; Food Contact Status compliant. Eastar 6763 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.

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 received a Platinum level Material Health Certificate from the Cradle to Cradle Products Innovation Institute. A Material Health Certificate is awarded to products that meet the Material Health requirements of the multi-attribute Cradle to Cradle Certified™ Product Standard. The Cradle to Cradle Products Innovation Institute is 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 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 the Material Health Certificate Registry.

Key Attributes

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

Applications

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

General

| | | | |
|-----------------------|---|---|---|
| Material Status | • Commercial: Active | | |
| Regional Availability | • Africa & Middle East • Asia Pacific | • Europe • Latin America | • North America |
| Features | • Amorphous • Biocompatible • E-beam Sterilizable • Ethylene Oxide Sterilizable • Food Contact Acceptable | • Good Colorability • Good Melt Strength • Good Stability • Good Sterilizability • Good Toughness | • Heat Sealable • High Clarity • Puncture Resistant • Radiation Sterilizable • Stress Whitening Resistant |

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General

| | | | |
|-------------------|---|---|---|
| Uses | <ul style="list-style-type: none"> Film Medical Devices Medical Packaging Medical/Healthcare Applications | <ul style="list-style-type: none"> Packaging Pharmaceutical Packaging Rigid Packaging Sheet | <ul style="list-style-type: none"> Thermoforming Applications Trays |
| Agency Ratings | <ul style="list-style-type: none"> ISO 10993 | <ul style="list-style-type: none"> USP Class VI | |
| Appearance | <ul style="list-style-type: none"> Clear/Transparent | | |
| Forms | <ul style="list-style-type: none"> Pellets | | |
| Processing Method | <ul style="list-style-type: none"> Extrusion Film Extrusion | <ul style="list-style-type: none"> Sheet Extrusion Thermoforming | |

ASTM & ISO Properties ¹

| Physical | Typical Value (English) | Typical Value (SI) | Test Method |
|--------------------------------------|-------------------------|------------------------|------------------------|
| Density / Specific Gravity | | | |
| -- | 1.27 | 1.27 | ASTM D792 |
| 73°F (23°C) | 1.27 g/cm ³ | 1.27 g/cm ³ | ISO 1183/D |
| -- | 1.27 g/cm ³ | 1.27 g/cm ³ | ASTM D1505 |
| Water Absorption | | | |
| 24 hr, 73°F (23°C), 50% RH | 0.13 % | 0.13 % | ASTM D570 |
| 24 hr, 73°F (23°C) | 0.13 % | 0.13 % | ISO 62 |
| Mechanical | Typical Value (English) | Typical Value (SI) | Test Method |
| Tensile Modulus (73°F (23°C)) | 305000 psi | 2100 MPa | ASTM D638 ISO 527-1 |
| Tensile Strength | | | ASTM D638 ISO 527-2 |
| Yield, 73°F (23°C) | 7250 psi | 50.0 MPa | |
| Break, 73°F (23°C) | 4060 psi | 28.0 MPa | |
| Tensile Elongation | | | |
| Break, 73°F (23°C) | 130 % | 130 % | ASTM D638 |
| Break, 73°F (23°C) | 100 % | 100 % | ISO 527-2 |
| Flexural Modulus | | | |
| 73°F (23°C) | 305000 psi | 2100 MPa | ASTM D790 |
| 73°F (23°C) | 290000 psi | 2000 MPa | ISO 178 |
| Flexural Stress | | | |
| 73°F (23°C) | 9860 psi | 68.0 MPa | ISO 178 |
| Yield, 73°F (23°C) | 10200 psi | 70.0 MPa | ASTM D790 |
| Tear Resistance | | | ASTM D2582 |
| MD : 73°F (23°C), 9.8 mil (250.0 µm) | 93 N | 93 N | |
| TD : 73°F (23°C), 9.8 mil (250.0 µm) | 93 N | 93 N | |
| Films | Typical Value (English) | Typical Value (SI) | Test Method |
| Film Thickness - Tested | 10 mil | 250 µm | ASTM D374 |
| Secant Modulus | | | ASTM D882 |
| MD : 9.8 mil (250 µm) | 276000 psi | 1900 MPa | |
| TD : 9.8 mil (250 µm) | 276000 psi | 1900 MPa | |

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| Films | Typical Value (English) | Typical Value (SI) | Test Method |
|--|--|--|-------------|
| Tensile Strength | | | ASTM D882 |
| MD : Yield, 9.8 mil (250 µm) | 7540 psi | 52.0 MPa | |
| TD : Yield, 9.8 mil (250 µm) | 7540 psi | 52.0 MPa | |
| MD : Break, 9.8 mil (250 µm) | 8560 psi | 59.0 MPa | |
| TD : Break, 9.8 mil (250 µm) | 7980 psi | 55.0 MPa | |
| Tensile Elongation | | | ASTM D882 |
| MD : Yield, 9.8 mil (250 µm) | 4.0 % | 4.0 % | |
| TD : Yield, 9.8 mil (250 µm) | 4.0 % | 4.0 % | |
| MD : Break, 9.8 mil (250 µm) | 400 % | 400 % | |
| TD : Break, 9.8 mil (250 µm) | 400 % | 400 % | |
| Dart Drop Impact ² | | | ASTM D1709A |
| 0°F (-18°C), 9.8 mil (250 µm) | 500 g | 500 g | |
| 73°F (23°C), 9.8 mil (250 µm) | 400 g | 400 g | |
| Elmendorf Tear Strength | | | ASTM D1922 |
| MD : 9.8 mil (250 µm) | 1400 g | 1400 g | |
| TD : 9.8 mil (250 µm) | 1700 g | 1700 g | |
| Trouser Tear Resistance ³ | | | ISO 6383-1 |
| MD | 206 lbf/in | 36.0 N/mm | |
| TD | 206 lbf/in | 36.0 N/mm | |
| Oxygen Permeability | | | ASTM D3985 |
| 73°F (23°C), 9.8 mil (250 µm), 50% RH | 25 cm ³ ·mil/ 100in ² /atm/24 hr | 10 cm ³ ·mm/m ² /atm/ 24 hr | |
| Water Vapor Transmission Rate | | | ASTM F1249 |
| 100°F (38°C), 100% RH, 9.8 mil (250 µm) | 0.45 g/100 in ² /24 hr | 7.0 g/m ² /24 hr | |
| Carbon Dioxide Permeability | | | ASTM D1434 |
| 73°F (23°C), 9.8 mil (250.0 µm) | 120 cm ³ ·mil/ 100in ² /atm/24 hr | 49 cm ³ ·mm/m ² /atm/ 24 hr | |
| Tear Propagation Resistance ⁴ | | | ASTM D1938 |
| MD : 73°F (23°C), 9.8 mil (250.0 µm) | 210 lbf/in | 36 kN/m | |
| TD : 73°F (23°C), 9.8 mil (250.0 µm) | 210 lbf/in | 36 kN/m | |
| Impact | Typical Value (English) | Typical Value (SI) | Test Method |
| Notched Izod Impact | | | |
| -40°F (-40°C) | 0.69 ft·lb/in | 37 J/m | ASTM D256 |
| 73°F (23°C) | 1.9 ft·lb/in | 100 J/m | ASTM D256 |
| -40°F (-40°C) | 2.0 ft·lb/in ² | 4.2 kJ/m ² | ISO 180 |
| 73°F (23°C) | 3.0 ft·lb/in ² | 6.2 kJ/m ² | ISO 180 |
| Unnotched Izod Impact | | | |
| -40°F (-40°C), 0.126 in (3.20 mm) | No Break | No Break | ASTM D4812 |
| -22°F (-30°C), 0.126 in (3.20 mm) | No Break | No Break | ASTM D4812 |
| -4°F (-20°C), 0.126 in (3.20 mm) | No Break | No Break | ASTM D4812 |
| 73°F (23°C), 0.126 in (3.20 mm) | No Break | No Break | ASTM D4812 |
| -40°F (-40°C) ⁵ | No Break | No Break | ISO 180/1U |
| -22°F (-30°C) ⁵ | No Break | No Break | ISO 180/1U |
| -4°F (-20°C) ⁵ | No Break | No Break | ISO 180/1U |
| 73°F (23°C) ⁵ | No Break | No Break | ISO 180/1U |

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| Impact | Typical Value (English) | Typical Value (SI) | Test Method |
|--|-----------------------------------|--------------------|-------------|
| Instrumented Dart Impact | | | |
| -40°F (-40°C), 0.0984 in (2.50 mm), Energy at Peak Load | 363 in·lb | 41.0 J | ASTM D3763 |
| -40°F (-40°C), 0.126 in (3.20 mm), Energy at Peak Load | 443 in·lb | 50.0 J | ASTM D3763 |
| 73°F (23°C), 0.0984 in (2.50 mm), Energy at Peak Load | 248 in·lb | 28.0 J | ASTM D3763 |
| 73°F (23°C), 0.126 in (3.20 mm), Energy at Peak Load | 292 in·lb | 33.0 J | ASTM D3763 |
| -40°F (-40°C), 0.0984 in (2.50 mm), Energy to Peak Force ^{6, 7} | 25.8 ft·lb | 35.0 J | ISO 6603-2 |
| -40°F (-40°C), 0.126 in (3.20 mm), Energy to Peak Force ^{6, 7} | 26.6 ft·lb | 36.0 J | ISO 6603-2 |
| 73°F (23°C), 0.0984 in (2.50 mm), Energy to Peak Force ^{6, 7} | 29.5 ft·lb | 40.0 J | ISO 6603-2 |
| 73°F (23°C), 0.126 in (3.20 mm), Energy to Peak Force ^{6, 7} | 32.5 ft·lb | 44.0 J | ISO 6603-2 |
| Hardness | Typical Value (English) | Typical Value (SI) | Test Method |
| Rockwell Hardness | | | |
| R-Scale, 73°F (23°C) | 106 | 106 | ASTM D785 |
| R-Scale, 73°F (23°C) | 109 | 109 | ISO 2039-2 |
| Thermal | Typical Value (English) | Typical Value (SI) | Test Method |
| Deflection Temperature Under Load | | | ASTM D648 |
| 66 psi (0.45 MPa), Unannealed | 158 °F | 70.0 °C | |
| 264 psi (1.8 MPa), Unannealed | 147 °F | 64.0 °C | |
| Glass Transition Temperature | 176 °F | 80.0 °C | DSC |
| Vicat Softening Temperature | 185 °F | 85.0 °C | ASTM D1525 |
| CLTE - Flow (-22 to 104°F (-30 to 40°C)) | 2.8E-5 in/in/°F | 5.1E-5 cm/cm/°C | ASTM D696 |
| Specific Heat | | | DSC |
| 140°F (60°C) | 0.311 Btu/lb/°F | 1300 J/kg/°C | |
| 212°F (100°C) | 0.421 Btu/lb/°F | 1760 J/kg/°C | |
| 302°F (150°C) | 0.449 Btu/lb/°F | 1880 J/kg/°C | |
| 392°F (200°C) | 0.471 Btu/lb/°F | 1970 J/kg/°C | |
| 482°F (250°C) | 0.490 Btu/lb/°F | 2050 J/kg/°C | |
| Thermal Conductivity (73°F (23°C)) | 1.5 Btu·in/hr/ft ² /°F | 0.21 W/m/K | ASTM C177 |
| Electrical | Typical Value (English) | Typical Value (SI) | Test Method |
| Surface Resistivity (73°F (23°C)) | 1.0E+17 ohms | 1.0E+17 ohms | ASTM D257 |
| Volume Resistivity (73°F (23°C)) | 1.0E+16 ohms·cm | 1.0E+16 ohms·cm | ASTM D257 |
| Dielectric Strength ⁸ | | | ASTM D149 |
| 73°F (23°C), Method A (Short-Time) | 410 V/mil | 16 kV/mm | |
| Dielectric Constant | | | ASTM D150 |
| 73°F (23°C), 1 kHz | 2.60 | 2.60 | |
| 73°F (23°C), 1 MHz | 2.40 | 2.40 | |
| Dissipation Factor | | | ASTM D150 |
| 73°F (23°C), 1 kHz | 5.0E-3 | 5.0E-3 | |
| 73°F (23°C), 1 MHz | 0.020 | 0.020 | |
| Arc Resistance | 158 sec | 158 sec | ASTM D495 |

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| Optical | Typical Value (English) | Typical Value (SI) | Test Method |
|----------------------------------|-------------------------|--------------------|-------------|
| Gloss (45°, 9.84 mil (250 µm)) | 108 | 108 | ASTM D2457 |
| Light Transmittance ⁹ | | | ASTM D1003 |
| Regular, 9.84 mil (250 µm) | 89.0 % | 89.0 % | |
| Total, 9.84 mil (250 µm) | 91.0 % | 91.0 % | |
| Clarity (9.84 mil (250 µm)) | 85.0 | 85.0 | ASTM D1746 |
| Haze (9.84 mil (250 µm)) | 0.800 % | 0.800 % | ASTM D1003 |

Processing Information

| Injection | Typical Value (English) | Typical Value (SI) |
|------------------------|-------------------------|--------------------|
| Drying Temperature | 149 °F | 65 °C |
| Drying Time | 4.0 to 6.0 hr | 4.0 to 6.0 hr |
| Processing (Melt) Temp | 480 to 520 °F | 249 to 271 °C |
| Mold Temperature | 61 to 100 °F | 16 to 38 °C |

Notes

¹ Typical properties: these are not to be construed as specifications.

² 12.7 mm dia. head, 127 mm dia. clamp, 600 mm drop

³ 7.9 in/min (200 mm/min)

⁴ Split Tear Method, 254 mm/min

⁵ 4 mm

⁶ 13.5 ft/sec (4.1 m/sec), 0.79 in (20 mm) Striker Diameter

⁷ 40 mm support and clamp diameter

⁸ 500 V/sec

⁹ Modified