EASTMAN

Technical Data Sheet

Eastman Cristal™ 400 Copolyester

Applications

- Bottles-skin care pkg
- Closures-fragrance pkg
- Color cosmetics packaging
- Fragrance packaging
- Jars-skin care pkg
- Personal care & cosmetics packaging
- Personal care bottles
- Skin care packaging

Key Attributes

- Ability to mold thick parts
- Ease of processing
- Easy to extrude, cut, decorate, and seal
- Excellent chemical resistance
- Excellent clarity and color
- Excellent colorability
- Good impact strength
- Good stiffness
- High gloss appearance
- Improved gate aesthetics
- Readily fill intricate molds
- Toughness

Product Description

Cristal™ 400 copolyester is a high flow product. It is designed and engineered specifically for cosmetics packaging applications. With its unsurpassed color and clarity and an unmatched ability to mold thick parts with improved gate aesthetics, Cristal™ is clearly a well suited copolyester for premium cosmetics packaging. Other outstanding features of Cristal™ are excellent chemical resistance, high gloss, and improvements in processing such as faster cycle times, and lower scrap rates. Cristal™ is also ideally suited for two-shot molding techniques due to its lower processing temperatures, very slow crystallization rate, and flow characteristics.

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 . Search for Eastman Chemical Company in *Cradle to Cradle Certified* Products Registry.

Typical Properties

Property[a]	Test Method[b]	Typical Value, Units[c]
General Properties		
Specific Gravity	D 792	1.28
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.)
Mechanical Properties (ISO Method)		
Tensile Strength @ Yield	ISO 527	49 MPa
Tensile Strength @ Break	ISO 527	21 MPa
Elongation @ Yield	ISO 527	4.2 %

Elongation @ Break	ISO 527	36 %
Tensile Modulus	ISO 527	2005 MPa
Mechanical Properties		
Tensile Stress @ Break	D 638	25 MPa (3625 psi)
Tensile Stress @ Yield	D 638	50 MPa (7200 psi)
Elongation @ Break	D 638	38 %
Elongation @ Yield	D 638	4.4 %
Tensile Modulus	D 638	2030 MPa (2.9 x 10^5 psi)
Flexural Strength	D 790	66 MPa (9570 psi)
Flexural Modulus	D 790	1810 MPa (2.6 x 10^5 psi)
Rockwell Hardness, R Scale	D 785	102
Izod Impact Strength, Notched		
@ 23°C (73°F)	D 256	104 J/m (1.9 ft·lbf/in.)
@ -40°C (-40°F)	D 256	38 J/m (0.7 ft·lbf/in.)
Impact Strength, Unnotched		
@ 23°C (73°F)	D 4812	-NB
@ -40°C (-40°F)	D 4812	-NB
Optical Properties		
Transmittance	D 1003	91.8 %
Haze	D 1003	0.24 %
Thermal Properties		
Deflection Temperature		
@ 0.455 MPa (66 psi)	D 648	68 °C (155 °F)
@ 1.82 MPa (264 psi)	D 648	61 °C (142 °F)
Typical Processing Conditions		
Drying Temperature		65 °C (150 °F)
Drying Time		8 hrs
Processing Melt Temperature		205-240 °C (400-465 °F)
Mold Temperature		16-38 °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.*

Comments

Properties reported here are based on limited testing. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

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