

EASTMAN

Technical Data Sheet Eastar™ Copolyester DN011

Application/Uses

- Cosmetic jar caps
- Cosmetic jars
- Displays
- Floor care
- Fragrance caps
- Lipstick containers
- Personal Care and Cosmetics
- Refrigerator interior components

Product Description

Eastar[™] Copolyester DN011 is a brilliantly clear polymer having excellent impact strength, chemical resistance, and low shrinkage rates. Eastar[™] Copolyester DN011 contains a mold release.

This product has been GREENGUARD INDOOR AIR QUALITY CERTIFIED®.

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This product has been CRADLE TO CRADLE CERTIFIED^{cm}

The CRADLE TO CRADLE CERTIFIED^{cm} Mark is a registered certification mark used under license through McDonough Braungart Design Chemistry (MBDC). MBDC is a global sustainability consulting and product certification firm. The CRADLE TO CRADLE® framework moves beyond the traditional goal of reducing the negative impacts of commerce ('eco-efficiency'), to a new paradigm of increasing its positive impacts ('eco-effectiveness'). At its core, Cradle to Cradle design perceives the safe and productive processes of nature's 'biological metabolism' as a model for developing a 'technical metabolism' flow of industrial materials. Product components can be designed for continuous recovery and reutilization as biological and technical nutrients within these metabolisms. For more information about MBDC and to obtain printable certificates for Eastman Copolyesters, visit http://www.mbdc.com.

Typical Properties

Property ^a	Test ^b Method	Typical Value, Units ^c
Specific Gravity	D 792	1.23
Mold Shrinkage Parallel to Flow	D 955	0.002-0.005 mm/mm (0.002- 0.005 in./in.)

Mechanical Properties

Tensile Stress @ Freak D 638 54 MPa (7800 psi) Tensile Stress @ Break D 638 54 MPa (7800 psi) Elongation @ Yield D 638 4% Elongation @ Break D 638 330% Tensile Modulus D 638 1800 MPa (2.6 x 10 ⁵ psi) Flexural Modulus D 790 1800 MPa (2.6 x 10 ⁵ psi) Flexural Strength D 790 66 MPa (9600 psi) Rockwell Hardness, R Scale D 785 105 Izod Impact Strength, Notched © 23°C (73°F) D 256 NB @ -40°C (-40°F) D 256 77 J/m (1.4 ft·lbf/in.) Impact Strength, Unnotched © 23°C (73°F) D 4812 NB @ -40°C (-40°F) D 4812 NB Impact Resistance (Puncture), Energy @ Max. Load © 23°C (73°F) D 3763 46 J (34 ft·lbf) @ -40°C (-40°F) D 3763 46 J (34 ft·lbf) 46 J (34 ft·lbf) Thermal Properties Deflection Temperature @ 0.455 MPa (66 psi) D 648 73°C (163°F) @ 1.82 MPa (264 psi) D 648 64°C (147°F)				
Elongation @ Yield	Tensile Stress @ Yield	D 638	44 MPa (6300 psi)	
Elongation @ Break	Tensile Stress @ Break	D 638	54 MPa (7800 psi)	
Tensile Modulus D 638 1800 MPa (2.6 x 10 ⁵ psi) Flexural Modulus D 790 Flexural Strength D 790 Rockwell Hardness, R Scale D 785 D 256 NB Q -40°C (-40°F) D 4812 MB Impact Strength, Unnotched Q 23°C (73°F) Q -40°C (-40°F) D 4812 NB Impact Resistance (Puncture), Energy @ Max. Load Q 23°C (73°F) Q -40°C (-40°F) D 3763 A6 J (34 ft·lbf) Thermal Properties Deflection Temperature Q 0.455 MPa (66 psi) Q 1.82 MPa (264 psi) D 648 Flexural Modulus D 790 Flexural Modulus D 790 Flexural Strength, Unotofe 96000 psi) Rockwell Hardness, R Scale D 1003 D 4812 NB Impact Strength, Unnotched Q 23°C (73°F) D 4812 NB Impact Resistance (Puncture), Energy @ Max. Load Q 23°C (73°F) D 3763 A6 J (34 ft·lbf) Thermal Properties Deflection Temperature Q 0.455 MPa (66 psi) D 648 D 64°C (147°F) Optical Properties Haze D 1003 Regular Transmittance D 1003 Regular Transmittance D 1003 P 29% Typical Processing Conditions Drying Temperature Flexural Modulus D 1000 Tock (160°F) Tock (160°F) Drying Time G hrs Processing Melt Temperature	Elongation @ Yield	D 638	4%	
Piexural Modulus	Elongation @ Break	D 638	330%	
D 790	Tensile Modulus	D 638	1800 MPa (2.6 x 10 ⁵ psi)	
Rockwell Hardness, R Scale D 785 105	Flexural Modulus	D 790	1800 MPa (2.6 x 10 ⁵ psi)	
Izod Impact Strength, Notched	Flexural Strength	D 790	66 MPa (9600 psi)	
@ 23°C (73°F) D 256 NB @ -40°C (-40°F) D 256 77 J/m (1.4 ft·lbf/in.) Impact Strength, Unnotched B 23°C (73°F) D 4812 NB @ -40°C (-40°F) D 4812 NB Impact Resistance (Puncture), Energy @ Max. Load B 23°C (73°F) D 3763 46 J (34 ft·lbf) @ -40°C (-40°F) D 3763 46 J (34 ft·lbf) Thermal Properties Deflection Temperature B 0.455 MPa (66 psi) D 648 73°C (163°F) © 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	Rockwell Hardness, R Scale	D 785	105	
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@ 23°C (73°F) D 4812 NB @ -40°C (-40°F) D 4812 NB Impact Resistance (Puncture), Energy @ Max. Load 23°C (73°F) D 3763 46 J (34 ft·lbf) @ -40°C (-40°F) D 3763 46 J (34 ft·lbf) Thermal Properties Deflection Temperature @ 0.455 MPa (66 psi) D 648 73°C (163°F) @ 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	@ -40°C (-40°F)	D 256	77 J/m (1.4 ft·lbf/in.)	
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Impact Resistance (Puncture), Energy @ Max. Load @ 23°C (73°F)	@ 23°C (73°F)	D 4812	NB	
@ 23°C (73°F) D 3763 46 J (34 ft·lbf) @ -40°C (-40°F) D 3763 46 J (34 ft·lbf) Thermal Properties Deflection Temperature @ 0.455 MPa (66 psi) D 648 73°C (163°F) @ 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	@ -40°C (-40°F)	D 4812	NB	
@ -40°C (-40°F) D 3763 46 J (34 ft·lbf) Thermal Properties Deflection Temperature 0 0.455 MPa (66 psi) D 648 73°C (163°F) @ 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	Impact Resistance (Puncture), Energy @ Max. Load			
Thermal Properties Deflection Temperature 0 0.455 MPa (66 psi) D 648 73°C (163°F) © 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	@ 23°C (73°F)	D 3763	46 J (34 ft·lbf)	
Deflection Temperature 0.455 MPa (66 psi) D 648 73°C (163°F) © 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%	@ -40°C (-40°F)	D 3763	46 J (34 ft·lbf)	
Deflection Temperature 0.455 MPa (66 psi) D 648 73°C (163°F) © 1.82 MPa (264 psi) D 648 64°C (147°F) Optical Properties Haze D 1003 <1.0%				
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Optical Properties Haze D 1003 <1.0%	@ 0.455 MPa (66 psi)		• •	
Haze D 1003 <1.0% Regular Transmittance D 1003 89% Total Transmittance D 1003 92% Typical Processing Conditions Drying Temperature 71°C (160°F) Drying Time 6 hrs Processing Melt Temperature 249-271°C (480-520°F)	@ 1.82 MPa (264 psi)	D 648	64°C (147°F)	
Haze D 1003 <1.0% Regular Transmittance D 1003 89% Total Transmittance D 1003 92% Typical Processing Conditions Drying Temperature 71°C (160°F) Drying Time 6 hrs Processing Melt Temperature 249-271°C (480-520°F)	Ontical Proporties			
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Drying Temperature 71°C (160°F) Drying Time 6 hrs Processing Melt Temperature 249-271°C (480-520°F)	Total Transmittance	D 1003	3270	
Drying Time 6 hrs Processing Melt Temperature 249-271°C (480-520°F)	Typical Processing Conditions			
Processing Melt Temperature 249-271°C (480-520°F)	Drying Temperature		71°C (160°F)	
16 2006 (60 1000F)	Drying Time		6 hrs	
Mold Temperature 16-38°C (60-100°F)	Processing Melt Temperature		249-271°C (480-520°F)	
Tiola Temperature ,	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.

Comments

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

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b Unless noted otherwise, the test method is ASTM.

^c Units are in SI or US customary units.

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