Product Data Sheet

Eastman Embrace™ Copolyester

Application/Uses

- Beverage packaging
- Distilled spirits packaging
- Flexible packaging
- Food packaging
- Household packaging
- Juice packaging
- Labels to fit high contour containers
- Personal care packaging
- Shrink labels
- Wrap around design

Key Attributes

- Greater than 75% ultimate shrinkage
- High shrink force
- Shrinks to fit contour bottles
- Sparkling clarity and high gloss
- Super-high print definition

Product Description

Eastman Embrace™ copolyester is a leader in the shrink film for dairy, water, juice, liquor, and sports and soft drink beverage packaging. Eastman Embrace™ copolyester provides excellent clarity, printability, and toughness, enabling marketers to increase shelf visibility, presence, and appeal for their products. With ultimate shrinkage of over 75%, Eastman Embrace™ copolyester is the ideal label material for marketers looking to differentiate their products in the competitive beverage market.

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This product has been CRADLE TO CRADLE CERTIFIED^{cm} Silver.
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 www.mbdc.com. Choose Eastman Chemical Company under Company Name in C2C Certified products to display a list of our products.

Typical Properties

Property[a]	Test[b] Method	Typical Value, Units[c]
Film Properties (Extruded/Cast Film)		
Inherent Viscosity	EMN-A-AC-G-V-1	0.70
Thickness of Film Tested		250 microns (10 mils)
Density	D 1505	1.30 g/cm^3
Haze	D 1003	0.7%
Gloss @ 60°	D 2457	166
Transparency	D 1746	67%
Regular Transmittance	D 1003	89%
Total Transmittance	D 1003	92%
Water Vapor Transmission Rate [d]	F 1249	7.6 g/m^2·24h (0.49 g/100$in.^2$·24h)
Gas Permeability, O_2 @ 30°C (86°F), 68% RH	D 3985	23 cm^3/m^2*24h*atm (15 cm^3·mil/100$in.^2$·24h·atm)
Elmendorf Tear Resistance		
M.D.	D 1922	7.5 N (760 gf)
T.D.	D 1922	7.5 N (760 gf)
PPT Tear Resistance		
M.D.	D 2582	61 N (14 lbf)
T.D.	D 2582	66 N (15 lbf)
Tear Propagation Resistance, Split Tear Method		
@ 254 mm/min (10 in./min) M.D.	D 1938	61 N/mm (348 lbf/in.)
@ 254 mm/min (10 in./min) T.D.	D 1938	61 N/mm (348 lbf/in.)
Tensile Strength @ Break		
M.D.	D 882	53 MPa (7600 psi)
T.D.	D 882	53 MPa (7600 psi)
Elongation @ Break		
M.D.	D 882	5%
T.D.	D 882	5%
Tensile Modulus		
M.D.	D 882	1570 MPa (2.3 x 10^5 psi)
T.D.	D 882	1560 MPa (2.3 x 10^5 psi)
Dart Impact	D 1709A	355 g
Vicat Softening Temperature	D 1525	74°C (165°F)
Glass Transition Temperature (T_g)	D 1525	71°C (167°F)
Film Properties (Stretched Film)		
Inherent Viscosity	EMN-A-AC-G-V-1	0.70
Thickness of Film Tested		50 microns (2 mils)

Density	D 1505	1.30 g/cm^3
Ultimate Shrinkage [e] @ 90°C		80%
Haze	D 1003	4.9%
Gloss @ 60°	D 2457	139
Transparency	D 1746	85%
Regular Transmittance	D 1003	86%
Total Transmittance	D 1003	92%
Color		
L*	D 2244	95.9
a*	D 2244	0.02
b*	D 2244	0.37
Water Vapor Transmission Rate [d]	F 1249	20 g/m^2·24h (1.3 g/100in.^{2}·24h)
Gas Permeability, O_2 @ 30°C (86°F), 68% RH	D 3985	71 cm^3/m^2*24h*atm (9.1 cm^3·mil/100in.^{2}·24h·atm)
Elmendorf Tear Resistance		
M.D.	D 1922	1.2 N (120 gf)
T.D.	D 1922	0.12 N (12 gf)
Tensile Strength @ Break		
M.D.	D 882	42 MPa (6100 psi)
T.D.	D 882	290 MPa (41000 psi)
Elongation @ Break		
M.D.	D 882	265%
T.D.	D 882	34%
Tensile Modulus		
M.D.	D 882	1800 MPa (2.6 x 10^5 psi)
T.D.	D 882	7250 MPa (10.5 x 10^5 psi)
Dart Impact	D 1709A	228 g
Glass Transition Temperature (T_g)	D 1525	71°C (169°F)
Surface Tension, Harmonic Mean		
Dispersive		38 dynes/cm
Polar		9 dynes/cm
Total		47 dynes/cm

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

[e] *For films with a stretch ratio of 5x.*

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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