

Technical Data Sheet

Eastman Embrace™ Copolyester

Chemical Synonym

Copolyester

Applications

- Home, garden & automotive packaging
- Labels non food contact
- Protective & performance film
- Shrink film food contact
- Shrink film non food contact

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.

This product has been GREENGUARD INDOOR AIR QUALITY CERTIFIED®.

The GREENGUARD INDOOR AIR QUALITY CERTIFIED® Mark is a registered certification mark used under license through the GREENGUARD Environmental Institute (GEI). GEI is an industry-independent, non-profit organization that oversees the GREENGUARD Certification Program. The GREENGUARD Certification Program is an industry independent, third-party testing program for low-emitting products and materials for indoor environments. For more information about GEI and to obtain printable certificates for Eastman™ Copolyesters, visit [www.gei.com](#). Choose Eastman Chemical Company under the Manufacturer category and click search to display a list of our products.

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.cradletothecradle.com](#). Search for Eastman Chemical Company in *Cradle to Cradle Certified* Products Registry.

Typical Properties

Property ^a	Test Method ^b	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/100in. 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/100in. 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)	D 1938	61 N/mm (348 lbf/in.)
M.D.		
@ 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		
a*	D 2244	0.02
b*	D 2244	0.37
L*	D 2244	95.9
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

^aUnless noted otherwise, all tests are run at 23°C (73°F) and 50% relative humidity.

^bUnless noted otherwise, the test method is ASTM.

^cUnits are in SI or US customary units.

^dTest conducted at 38°C (100°F) and 100% relative humidity.

^eFor 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.

Eastman and its marketing affiliates shall not be responsible for the use of this information, or of any product, method, or apparatus mentioned, and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and for the health 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.

2/28/2018 11:35:39 AM