

# Technical Data Sheet

## Eastman Spectar™ Copolyester 14471

### Applications

- Displays/in-store fixtures
- Indoor signs
- Industrial
- Lighting
- Outdoor signs
- Point-of-purchase
- Shelving solutions-retail
- Skylights
- Visual merchandising
- Walls

### Key Attributes

- Easy to print and decorate
- Excellent clarity
- Excellent thermoforming characteristics
- Good chemical resistance
- Odorless
- Outstanding impact resistance
- Outstanding toughness allows downgauging
- Resists chipping and cracking
- Versatile - easy to fabricate

### Product Description

Eastman Spectar™ copolyester (PETG) extrudes into plastic sheet that is sparkling clear, tough, chemically resistant, odor-free, versatile, easy to work with and affordable. Its toughness allows fabricators to use thinner-gauge sheet than with other common materials, resulting in lower material costs. Yet it can be extruded into sheets as thick as 12 mm (1/2 in.). It extrudes at a low temperature and will not crystallize or develop a crystalline haze. Cleaning solutions will not turn Eastman Spectar™ copolyester white. It is easy to fabricate, allowing greater design freedom. It can be laser cut, routed, welded, drilled, die-punched, bent hot or cold, or joined by screws, rivets, or bolts. It can also be cut on conventional table, band, or radial-arm saws with blades commonly used for plastic. Spectar™ copolyester can be vacuum-formed at lower temperatures than other plastics without predrying the sheet. Eastman Spectar™ copolyester can be finished easily. Its edges can be polished by using commercial edge-finishing equipment, sanding, solvents, flame-polishing or buffing. It forms clear, strong bonds with commercially available cements and solvents. It accepts screen-printing, painting, and hot-stamping easily. Surface scratches or scuff marks can be removed using a common heat gun.

Sheet made from Eastman Spectar™ copolyester (PETG) is available from plastic sheet distributors throughout North America, Canada, Europe, Asia, and Latin America.

This product has been GREENGUARD INDOOR AIR QUALITY CERTIFIED®.

GREENGUARD Certification recognizes Eastman for manufacturing products with low chemical and particle emissions for better indoor environments. For more information about GEI and to obtain printable certificates for Eastman™ Copolyesters, visit [www.greenguard.org](http://www.greenguard.org). Choose Eastman Chemical Company under the Manufacturer category and click search to display a list of our products.

This product is certified to NSF/ANSI Standard 51 for Food Equipment Materials.

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.c2ccertified.org](http://www.c2ccertified.org). Search for Eastman Chemical Company in *Cradle to Cradle Certified* Products Registry.

# Typical Properties

Property <sup>a</sup>	Test Method <sup>b</sup>	Typical Value, Units <sup>c</sup>
<b>General</b>		
Thickness of Sheet Tested		3 mm
<b>Electrical Properties (ASTM Method)</b>		
Dielectric Constant		
1 kHz	D 150	2.6
1 MHz	D 150	2.4
Dissipation Factor		
1 kHz	D 150	0.005
1 MHz	D 150	0.02
Arc Resistance	D 495	158 sec
Volume Resistivity	D 257	10 <sup>15</sup> ohm·cm
Surface Resistivity	D 257	10 <sup>16</sup> ohms/square
Dielectric Strength, Short Time, 500 V/sec rate-of-rise	D 149	16.1 kV/mm (410 V/mil)
<b>General Properties (ASTM Method)</b>		
Density	D 1505	1.27 g/cm <sup>3</sup>
Water Absorption, 24 h immersion	D 570	0.2 %
<b>General Properties (ISO Method)</b>		
Density	ISO 1183	1270 kg/m <sup>3</sup>
Water Absorption, 24 h immersion	ISO 62	0.2 %
<b>Mechanical Properties (ASTM Method)</b>		
Tensile Stress @ Yield	D 638	53 MPa (7700 psi)
Tensile Stress @ Break	D 638	26 MPa (3800 psi)
Elongation @ Yield	D 638	4.8 %
Elongation @ Break	D 638	50 %
Tensile Modulus	D 638	2200 MPa (3.2 x 10 <sup>5</sup> psi)
Flexural Modulus	D 790	2100 MPa (3.1 x 10 <sup>5</sup> psi)
Flexural Strength	D 790	77 MPa (11200 psi)
Rockwell Hardness, R Scale	D 785	115
Izod Impact Strength, Notched		
@ 0°C (32°F)	D 256	66 J/m (1.2 ft·lbf/in.)
@ 23°C (73°F)	D 256	88 J/m (1.7 ft·lbf/in.)
@ -30°C (-22°F)	D 256	39 J/m (0.7 ft·lbf/in.)
Impact Strength, Unnotched		
@ 0°C (32°F)	D 4812	NB
@ 23°C (73°F)	D 4812	NB
@ -30°C (-22°F)	D 4812	NB
Impact Resistance (Puncture), Energy @ Max. Load		
@ 0°C (32°F)	D 3763	40 J (30 ft·lbf)
@ -10°C (14°F)	D 3763	42 J (31 ft·lbf)
@ -20°C (-4°F)	D 3763	43 J (32 ft·lbf)
@ 23°C (73°F)	D 3763	33 J (24 ft·lbf)
@ -30°C (-22°F)	D 3763	47 J (34 ft·lbf)
<b>Mechanical Properties (ISO Method)</b>		
Tensile Stress @ Yield	ISO 527	53 MPa
Tensile Stress @ Break	ISO 527	26 MPa
Elongation @ Yield	ISO 527	4.7 %
Elongation @ Break	ISO 527	40 %
Tensile Modulus	ISO 527	2200 MPa
Flexural Modulus	ISO 178	2100 MPa
Flexural Strength	ISO 178	69 MPa
Izod Impact Strength, Notched		

@ 0°C	ISO 180	6.1 kJ/m <sup>2</sup>
@ 23°C	ISO 180	11.5 kJ/m <sup>2</sup>
@ -30°C	ISO 180	4.4 kJ/m <sup>2</sup>
<b>Charpy Impact Strength, Notched</b>		
@ 0°C	ISO 179	4.2 kJ/m <sup>2</sup>
@ 23°C	ISO 179	10 kJ/m <sup>2</sup>
@ -30°C	ISO 179	3.3 kJ/m <sup>2</sup>
<b>Charpy Impact Strength, Unnotched</b>		
@ 0°C	ISO 179	NB
@ 23°C	ISO 179	NB
@ -40°C	ISO 179	NB
<b>Impact Resistance (Puncture), Energy @ Max. Load</b>		
@ 0°C	ISO 6603-2	61 J
@ -10°C	ISO 6603-2	70 J
@ -20°C	ISO 6603-2	73 J
@ 23°C	ISO 6603-2	59 J
@ -30°C	ISO 6603-2	74 J
<b>Optical Properties (ASTM Method)</b>		
Haze	D 1003	<1 %
Regular Transmittance	D 1003	89 %
Total Transmittance	D 1003	91 %
<b>Gloss</b>		
@ 60°	D 523	159
<b>Color, b*</b>		
CIELAB, Illuminant D6500, 10°	E 308	<1
<b>Observer</b>		
<b>Yellowness Index</b>		
CIELAB, Illuminant D6500, 10°	D 1925	<1.5
<b>Observer</b>		
Refractive Index, n <sub>D</sub>	D 542	1.57
<b>Thermal Properties (ASTM Method)</b>		
<b>Deflection Temperature</b>		
@ 0.455 MPa (66 psi)	D 648	74 °C (164 °F)
@ 1.82 MPa (264 psi)	D 648	70 °C (157 °F)
<b>Vicat Softening Temperature</b>		
@ 1 kg load	D 1525	83 °C (181 °F)
Oxygen Index <sup>d</sup>	D 2863	26 %
Coefficient of Linear Thermal Expansion <sup>e</sup>	D 696	7 x 10 <sup>-5</sup> /°C (mm/mm·°C) (4 x 10 <sup>-5</sup> /°F (in./in.·°F))
<b>Thermal Properties (Flammability)</b>		
UL Flammability Classification	UL 94	94V-2
Flammability/France	NFP 92-501	M2
Flammability/Germany <sup>f</sup>	DIN 4102 - Part 1	B1
Flammability/Great Britain <sup>f</sup>	BS 476 - Part 7	1Y
<b>Thermal Properties (ISO Method)</b>		
<b>Deflection Temperature</b>		
@ 0.45 MPa	ISO 75	72 °C
@ 1.80 MPa	ISO 75	68 °C
<b>Vicat Softening Temperature</b>		
@ 1 kg load	ISO 306	83 °C
@ 5 kg load	ISO 306	78 °C

<sup>a</sup>Unless noted otherwise, all tests are run at 23°C (73°F) and 50% relative humidity.

<sup>b</sup>Unless noted otherwise, the test method is ASTM.

<sup>c</sup>Units are in SI or US customary units.

<sup>d</sup>Dripping and warpage of samples during testing can cause erratic test results.

<sup>e</sup>-30°C to 23°C

<sup>f</sup>Indicative testing only. Only 1 or 2 samples were tested to the specified test method, and the full requirements of the standards were not met. The results do not indicate compliance with a regulatory requirement.

## 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.

## General

Specimens were machined from extruded sheeting with a thickness as indicated. For Flammability/Great Britain, a suffix Y is added to the classification if any softening and/or other behaviour that may affect flame spread occurs.

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