Eastman Spectar™ Copolyester

(Plastic Sheet) Typical Properties

Durability. Sustainability. Flexibility.

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Typical Properties of Eastman Spectar™ Copolyester (Plastic Sheet)—ASTM Method

Property[a]	Conditions	ASTM Method		Units		Typical Value					
						2 mm		3 mm		6 mm	
				SI	U.S. Customary	SI	U.S. Customary	SI	U.S. Customary	SI	U.S. Customary
GENERAL											
Density	23°C (73°F)	D1505		kg/m^3	g/cm^3	1,270	1.27	1,270	1.27	1,270	1.27
Water Absorption	23°C (73°F), 24h immersion	D570		%	%	0.3	0.3	0.2	0.2	0.1	0.1
MECHANICAL											
Tensile Stress @ Yield	50 mm/min (2 in./min)	D638		MPa	psi	53	7,700	53	7,700	53	7,700
Tensile Stress @ Break	50 mm/min (2 in./min)	D638		MPa	psi	31	4,500	26	3,800	26	3,800
Elongation @ Yield	50 mm/min (2 in./min)	D638		%	%	4.7	4.7	4.8	4.8	5.0	5.0
Elongation @ Break	50 mm/min (2 in./min)	D638		%	%	210	210	50	50	40	40
Tensile Modulus	5.0 mm/min (0.2 in./min)	D638		MPa	10^5 psi	—	—	2,200	3.2	—	—
Flexural Modulus	1.27 mm/min (0.05 in./min)	D790		MPa	10^5 psi	2,200	3.2	2,100	3.1	2,000	2.9
Flexural Strength	1.27 mm/min (0.05 in./min)	D790		MPa	psi	71	10,300	77	11,200	83	12,000
Rockwell Hardness	—	D785		R Scale	R Scale	104	104	115	115	117	117
Izod Impact Strength, Notched	23°C (73°F)	D256		J/m	ft·lbf/in.	—	—	88	1.7	62	1.2
	0°C (32°F)	D256		J/m	ft·lbf/in.	—	—	66	1.2	—	—
	−30°C (222°F)	D256		J/m	ft·lbf/in.	—	—	39	0.7	—	—
Impact Strength, Unnotched	23°C (73°F)	D4812		J/m	ft·lbf/in.	—	—	NB[b]	NB[b]	NB[b]	NB[b]
	0°C (32°F)	D4812		J/m	ft·lbf/in.	—	—	NB[b]	NB[b]	—	—
	−30°C (−22°F)	D4812		J/m	ft·lbf/in.	—	—	NB[b]	NB[b]	—	—
Impact Resistance, Puncture, Energy @ Max. Load	23°C (73°F)	D3763		J	ft·lbf	21	15	33	24	71	53
	0°C (32°F)	D3763		J	ft·lbf	25	18	40	30	93	69
	−10°C (14°F)	D3763		J	ft·lbf	26	19	42	31	96	71
	−20°C (−4°F)	D3763		J	ft·lbf	28	21	43	32	>100	>74
	−30°C (−22°F)	D3763		J	ft·lbf	25	18	47	34	>100	>74

[a] *Unless noted otherwise, all tests are run @ 23°C (73°F) and 50% relative humidity, using specimens machined from extruded sheeting with a thickness as indicated.*

[b] *Nonbreak as defined in ASTM D 4812 using specimens having a thickness as indicated.*

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.

Sound Transmission Classification

Sheet manufactured from Spectar™ copolyester has been tested to determine its sound dampening capabilities. Test methods employed to determine the Sound Transmission Class (STC) were ASTM E 90-90 and Classification E 413-87. Results show that 3 mm (0.118 in.) sheet made from Spectar™ copolyester would have an STC value of 24 dB. This value is statistically the same as polycarbonate and acrylic sheet products that are typically used for sound dampening applications.

Typical Properties of Eastman Spectar™ Copolyester (Plastic Sheet)—ASTM Method (Continued)

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Property[a]	Conditions	Test Method		Units		Typical Value					
						2 mm		3 mm		6 mm	
				SI	U.S. Customary	SI	U.S. Customary	SI	U.S. Customary	SI	U.S. Customary
THERMAL											
Deflection Temperature (HDT)	0.455 MPa (66 psi)	ASTM D648		°C	°F	—	—	74	164	76	169
	1.82 MPa (264 psi)	ASTM D648		°C	°F	—	—	70	157	73	164
Vicat Softening Temperature	1 kg	ASTM D1525		°C	°F	—	—	83	181	—	—
UL Flammability Classification	—	UL 94		UL Rating	UL Rating	94HB	94HB	94V-2	94V-2	94V-2	94V-2
Flammability/France	—	NF P 92-501		—	—	—	—	M2	M2	—	—
Flammability/Germany	—	DIN 4102, Part 1		—	—	—	—	B1[b]	B1[b]	—	—
Flammability/Great Britain	—	BS 476, Part 7:19		—	—	—	—	1Y[b,c]	1Y[b,c]	—	—
Oxygen Index[d]	—	ASTM D2863		%	%	—	—	26	26	—	—
Coefficient of Linear Thermal Expansion (−30° to 23°C)	—	ASTM D696		10^{-5}/°C	10^{-5}/°F	7	4	7	4	7	4
OPTICAL											
Haze	—	ASTM D1003		%	%	<1	<1	<1	<1	<2	<2
Transmittance	Regular	ASTM D1003		%	%	90	90	89	89	87	87
	Total	ASTM D1003		%	%	92	92	91	91	89	89
Gloss	60° Angle	ASTM D523		units	units	182	182	159	159	145	145
Color, b*	CIELAB, Illuminant D6500, 10° Observer	ASTM E308		units	units	<1	<1	<1	<1	<1	<1
Yellowness Index	CIELAB, Illuminant D6500, 10° Observer	ASTM D1925		units	units	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Refractive Index, N_d	—	ASTM D542		—	—	1.57	1.57	1.57	1.57	1.57	1.57
ELECTRICAL											
Dielectric Constant	1kHz	ASTM D150		—	—	—	—	2.6	2.6	—	—
	1MHz	ASTM D150		—	—	—	—	2.4	2.4	—	—
Dissipation Factor	1kHz	ASTM D150		—	—	—	—	0.005	0.005	—	—
	1MHz	ASTM D150		—	—	—	—	0.02	0.02	—	—
Arc Resistance	—	ASTM D495		s	s	—	—	158	158	—	—
Volume Resistivity	—	ASTM D257		ohm·cm	ohm·cm	—	—	10^{15}	10^{15}	—	—
Surface Resistivity	—	ASTM D257		ohms/square	ohms/square	—	—	10^{16}	10^{16}	—	—
Dielectric Strength Short Time	500 V/s rate-of-rise	ASTM D149		kV/mm	V/mil	20.3	520	16.1	410	11.3	290

[a] *Unless noted otherwise, all tests are run @ 23°C (73°F) and 50% relative humidity, using specimens machined from extruded sheeting with a thickness as indicated.*

[b] *Indicative testing only. Only 1 or 2 samples were tested to the specified test methods, and the full requirements of the standards were not met. The results do not indicate compliance with a regulatory requirement.*

[c] *A suffix Y is added to the classification if any softening and/or other behavior that may affect flame spread occurs.*

[d] *Dripping and warpage of samples during testing can cause erratic test results.*

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.

Figure 1

Flexural Modulus (ASTM D790) vs. Temperature
Eastman Spectar™ Copolyester, 3 mm

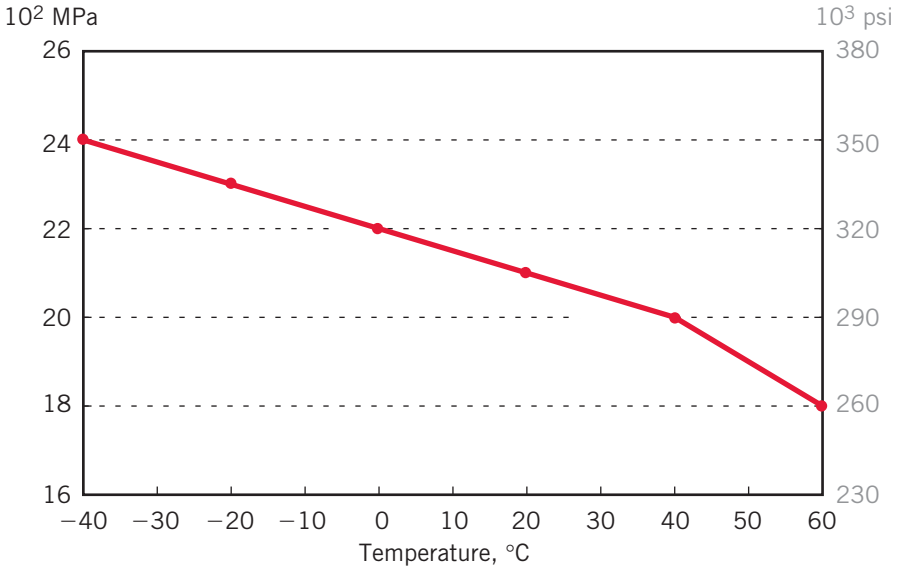


Figure 2

Flexural Strength (ASTM D790) vs. Temperature
Spectar™ Copolyester, 3 mm

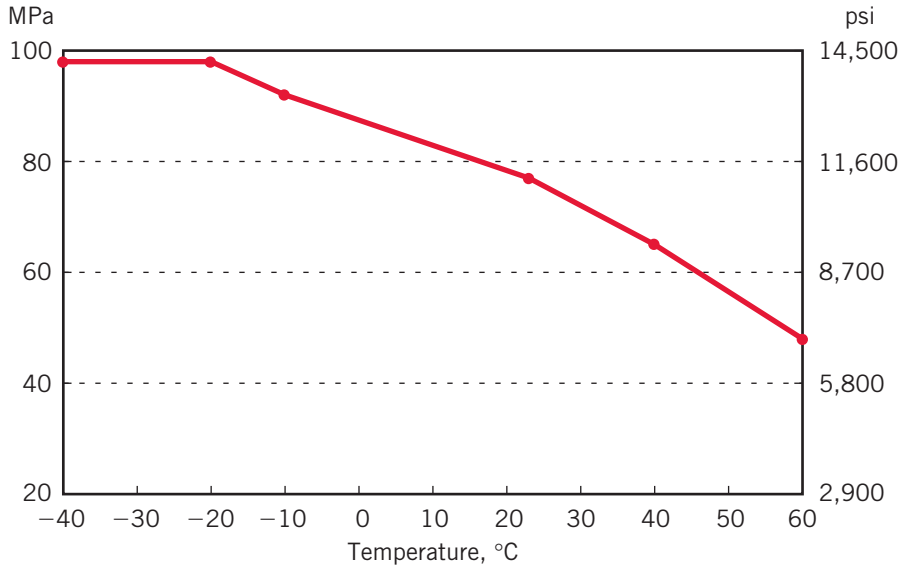


Figure 3

Izod Impact Strength, Notched (ASTM D256) vs. Temperature
Eastman Spectar™ Copolyester, 3 mm

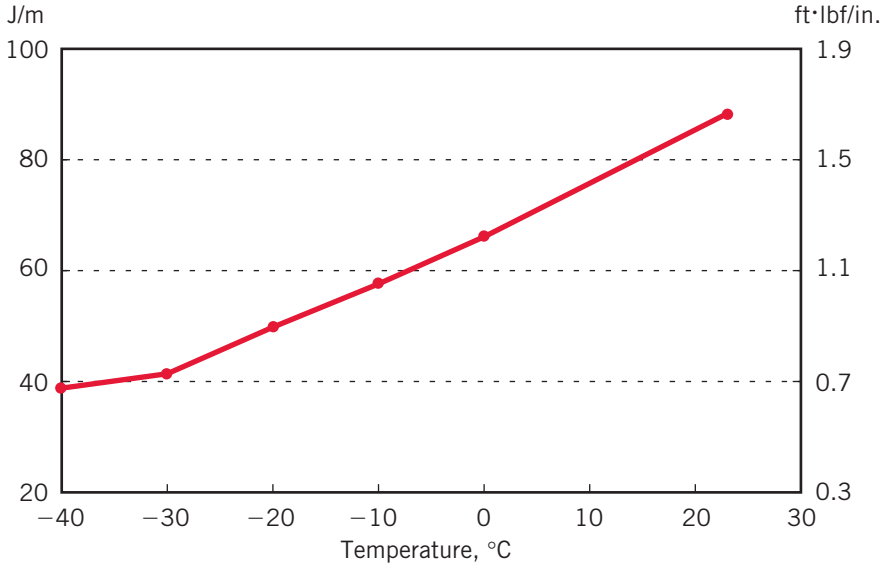
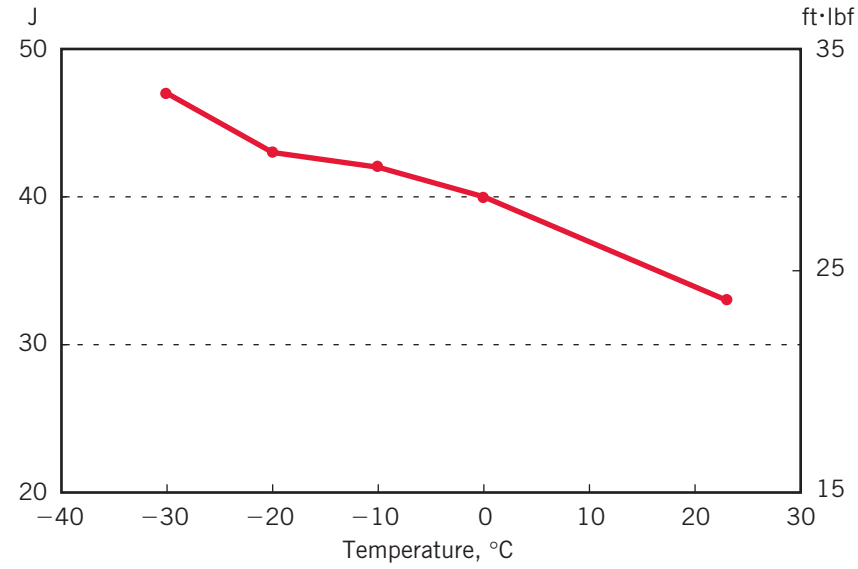


Figure 4

Impact Resistance, Puncture (ASTM D3763) vs. Temperature
Spectar™ Copolyester, 3 mm



Typical Properties of Eastman Spectar™ Copolyester (Plastic Sheet)—ISO Method

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Property[a]	Conditions	Test Method		Units	Typical Value		
					2 mm	3 mm	6 mm
GENERAL							
Density	23°C	ISO 1183		kg/m^3	1,270	1,270	1,270
Water Absorption	23°C, 24h immersion	ISO 62		%	0.3	0.2	0.1
MECHANICAL							
Tensile Stress @ Yield	50 mm/min	ISO 527		MPa	53	53	53
Tensile Stress @ Break	50 mm/min	ISO 527		MPa	31	26	26
Elongation @ Yield	50 mm/min	ISO 527		%	4.6	4.7	4.9
Elongation @ Break	50 mm/min	ISO 527		%	230	40	50
Tensile Modulus	1.0 mm/min	ISO 527		MPa	2,100	2,200	2,100
Flexural Modulus	1.7 mm/min	ISO 178		MPa	2,200	2,100	2,000
Flexural Strength	1.7 mm/min	ISO 178		MPa	60	69	77
Izod Impact Strength, Notched	23°C	ISO 180		kJ/m^2	—	11.5	7.4
	0°C	ISO 180		kJ/m^2	—	6.1	—
	−30°C	ISO 180		kJ/m^2	—	4.4	—
Charpy Impact Strength, Notched	23°C	ISO 179		kJ/m^2	—	10	6.3
	0°C	ISO 179		kJ/m^2	—	4.2	—
	−30°C	ISO 179		kJ/m^2	—	3.3	—
Charpy Impact Strength, Unnotched	23°C	ISO 179		kJ/m^2	—	NB[b]	NB[b]
	0°C	ISO 179		kJ/m^2	—	NB[b]	—
	−40°C	ISO 179		kJ/m^2	—	NB[b]	—
Impact Resistance, Puncture,	23°C	ISO 6603-2		J	35	59	112
Energy @ Max. Load	0°C	ISO 6603-2		J	38	61	143
	−10°C	ISO 6603-2		J	43	70	>150
	−20°C	ISO 6603-2		J	34	73	>150
	−30°C	ISO 6603-2		J	46	74	>150
THERMAL							
Deflection Temperature	0.45 MPa	ISO 75		°C	—	72	75
	1.80 MPa	ISO 75		°C	—	68	72
Vicat Softening Temperature	1 kg	ISO 306		°C	—	83	—
	5 kg	ISO 306		°C	—	78	—
Flammability/France	—	NF P 92-501		—	—	M2	—
Flammability/Germany	—	DIN 4102, Part 1		—	—	B1[c]	—
Flammability/Great Britain	—	BS 476, Part 7:19		—	—	1Y[c,d]	—

[a] *Unless noted otherwise, all tests are run @ 23°C (73°F) and 50% relative humidity, using specimens machined from extruded sheeting with a thickness as indicated.*
[b] *Nonbreak as defined in ISO 179 using specimens having a thickness as indicated.*
[c] *Indicative testing only. Only 1 or 2 samples were tested to the specified test methods, and the full requirements of the standards were not met. The results do not indicate compliance with a regulatory requirement.*
[d] *A suffix Y is added to the classification if any softening and/or other behavior that may affect flame spread occurs.*

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Figure 5

Charpy Impact Strength, Notched (ISO 179) vs. Temperature
Eastman Spectar™ Copolyester, 3 mm

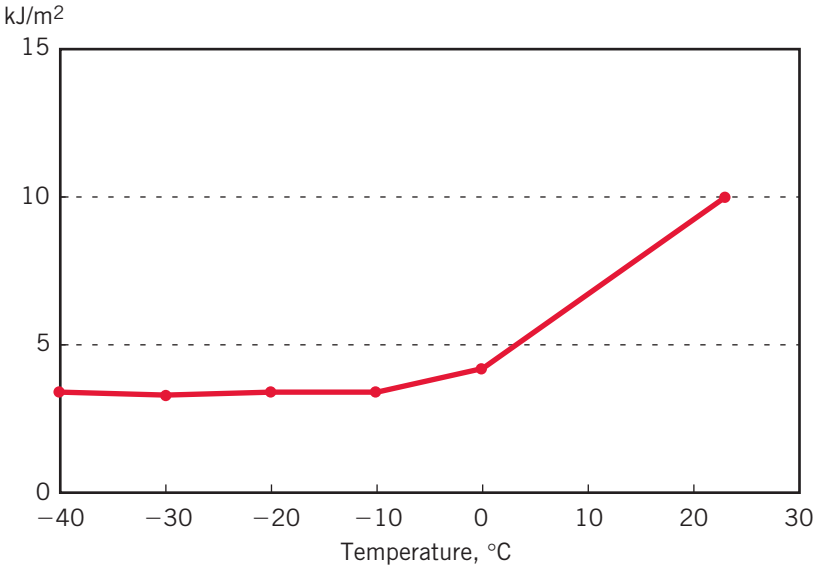


Figure 6

Izod Impact Strength, Notched (ISO 180) vs. Temperature
Spectar™ Copolyester, 3 mm

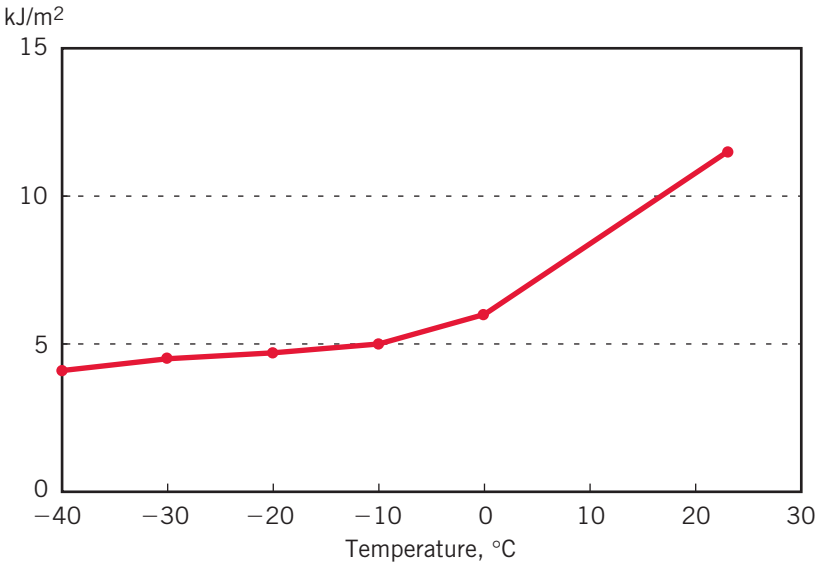
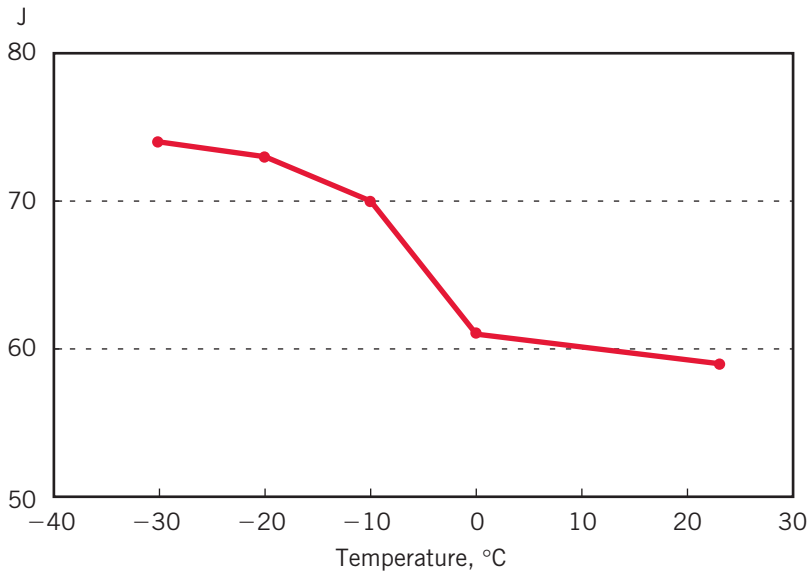


Figure 7

Impact Resistance, Puncture (ISO 6603-2) vs. Temperature
Eastman Spectar™ Copolyester, 3 mm



Conversions of metric/U.S. customary values may have been rounded off and therefore may not be exact conversions.

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Material Safety Data Sheets providing safety precautions, that should be observed when handling and storing Eastman products, are available online or by request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

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