



STYRON 685D General Purpose Polystyrene Resin

STYRON™ 685D is a high heat resistance, high tensile strength and high stiffness, general purpose polystyrene resin. It is recommended for applications where tensile and melt strength, as well as heat resistance properties are important. It is commonly used for extrusion applications such as foam disposables, medical and oriented polystyrene sheet. STYRON 685D has been used in consumer electronics and packaging applications.

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| Main Characteristics | <ul style="list-style-type: none"> • High heat resistance • High tensile strength | <ul style="list-style-type: none"> • High stiffness • FDA Compliant ⁽¹⁾
Complies with CSA
Complies with CANADIAN HPFB NO
OBJECTION (WITH LIMITATIONS) |
| Applications | <ul style="list-style-type: none"> • Foam disposables • Medical • OPS | <ul style="list-style-type: none"> • Packaging • Consumer electronics |

Properties ⁽²⁾	Test Method		S.I.		English		Metric		
	ISO	ASTM	Value	Unit	Value	Unit	Value	Unit	
Physical									
Melt flow rate (200°C / 5 kg)	1133	D 1238	1.5	g/10 min	1.5	g/10 min	1.5	g/10 min	
Specific Gravity	1183	D 792	1.04		1.04		1.04		
Linear Thermal Expansion (10 ⁻⁵)	1135	D 696	9.0	cm/cm /°C	5.0	in/in/°F	9.0	cm/cm/°C	
Mold Shrinkage		D 955	0.003 - 0.007	cm/cm	0.003 - 0.007	in/in	0.003 - 0.007	cm/cm	
Optical									
Transmittance		D 1003	90	%	90	%	90	%	
Haze		D 1003	1.0	%	1.0	%	1.0	%	
Refractive Index		D 542	1.59		1.59		1.59		
Thermal									
Vicat Softening Temperature (120°C/hr, 1 kg)	306A	D 1525-B	108	°C	227	°F	108	°C	
Deflection Temperature Under Load (Injection molded)	75A	D 648							
@ 0.45 MPa (66 psi), Unannealed			96	°C	205	°F	96	°C	
@ 1.8 MPa (264 psi), Unannealed			84	°C	183	°F	84	°C	
Injection Molded Mechanical Properties									
Impact Strength:									
Notched Izod (12.7x3.2 mm (0.5x0.125 in) specimen @ 23°C (73°F))	180/4A	D 256	21.4	J/m	0.4	ft-lb/in	2.2	kg-cm/cm	
Gardner Impact @ 23°C (73°F)		D 3029	0.113	J	1.0	in-lb	1.13	cm-kg	
Tensile Properties 12.7x3.2 mm (0.5x0.125 in) specimen:									
Yield Tensile Strength (0.2 in/min) rate	5 mm/min	527	D 638	53	MPa	7700	psi	542	kg/cm ²
Ultimate Tensile Strength (0.2 in/min) rate	5 mm/min	527	D 638	53	MPa	7700	psi	542	kg/cm ²
Ultimate Elongation (0.2 in/min) rate	5	527	D 638	2.0	%	2.0	%	2.0	%
Tensile Modulus (0.2 in/min) rate	5	527	D 638	2920	MPa	424,000	psi	29200	kg/cm ²



Flexural Properties		1.3 mm/min (0.05 in/min) rate						
Flexural Strength (3-point)	178	D 790	106	MPa	15300	psi	1060	kg/cm ²
Flexural Modulus (3-point)	178	D 790	3150	MPa	457,000	psi	31500	kg/cm ²

Flammability Properties ⁽³⁾		UL 94 Classification:						
	@1.47 mm (0.058 in) thickness	HB	HB	HB	HB	HB	HB	HB

- (1) When used unmodified for the manufacture of food contact articles, STYRON 685D will comply with Food Additive Regulations 21 CFR 177.1640 under the U.S. Food, Drug and Cosmetic Act. Such uses are subject to good manufacturing practices and any other limitations which are part of the statute or regulations. These should be consulted for complete details.
- (2) Typical properties, not to be considered as specification limits.
- (3) This numerical flame-spread rating is not intended to reflect hazards presented by material under actual fire conditions.

Product Stewardship

Americas Styrenics has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our Product Stewardship program rests with each and every individual involved with Americas Styrenics products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Americas Styrenics strongly encourages its customers to review both their manufacturing processes and their applications of Americas Styrenics products from the standpoint of human health and environmental quality to ensure that Americas Styrenics products are not used in ways for which they are not intended or tested. Americas Styrenics personnel are available to answer your questions and to provide reasonable technical support. Americas Styrenics product literature, including safety data sheets, should be consulted prior to use of Americas Styrenics products. Current safety data sheets are available from Americas Styrenics.

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Americas Styrenics will not knowingly sell or sample any product or service (“Product”) into any commercial or developmental application that is intended for:

- a. permanent (long term) contact with internal body fluids or internal body tissues. Long term is a use which exceeds 72 continuous hours
- b. use in cardiac prosthetic devices regardless of the length of time involved (Cardiac prosthetic devices include, but are not limited to, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass assisted devices);
- c. use as a critical component in medical devices that support or sustain human life; or
- d. use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

Additionally, all Products intended for use in pharmaceutical applications, other than pharmaceutical packaging, must pass the current Pharmaceutical Liability Guidelines.

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