



STYRON® 421
High Impact Polystyrene Resin

STYRON® 421 is a high impact polystyrene with an excellent balance of flow, toughness, stiffness and heat resistance as compared to other high impact polystyrene resins. It is appropriate for applications where stiffness and toughness combined with high contact clarity and trim ability are important. It offers improved flow versus STYRON 484.

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| Main Characteristics | <ul style="list-style-type: none"> • Stiffness • Flow • Heat resistance • Contact clarity | Complies with: <ul style="list-style-type: none"> • U.S. FDA 21 CFR 177.1640 • Europe EU-Directive 2002/72/EC • Canada HPFB No Objection (with limitations) Consult the regulations for complete details. |
| Applications | <ul style="list-style-type: none"> • Appliances • Refrigeration • Packaging/disposables • Consumer electronics | <ul style="list-style-type: none"> • Injection molding • Extrusion • Thermoforming |

Properties ⁽²⁾	Test Method		S.I.		English		Metric	
	ISO	ASTM	Value	Unit	Value	Unit	Value	Unit
Physical								
Melt flow rate (200°C / 5 kg)	1133/8	D 1238	3.9	g/10 min	3.9	g/10 min	3.9	g/10 min
Specific Gravity	1183	D 792	1.04		1.04		1.04	
Linear Thermal Expansion (10 ⁻⁵)	11359	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
Thermal								
Vicat Softening Temperature (120°C/hr, 1 kg)	306A	D 1525-B	104	°C	220	°F	104	°C
Deflection Temperature Under Load (Injection molded)	75A	D 648						
@ 0.45 MPa (66 psi), Unannealed			88	°C	190	°F	88	°C
@ 1.8 MPa (264 psi), Unannealed			79	°C	175	°F	79	°C
Injection Molded Mechanical Properties								
Impact Strength:								
Notched Izod 12.7x3.2 mm (0.5x.125 in) specimen	180/4A	D 256						
@ 23°C (73°F)			112	J/m	2.1	ft-lb/in	11.4	kg-cm/cm
@ -18°C (0°F)			59	J/m	1.1	ft-lb/in	60	kg-cm/cm
Gardner Impact @ 23°C (73°F)		D 3029	12.4	J	110	in-lb	127	cm-kg
Tensile Properties 12.7x3.2 mm (0.5x0.125 in) specimen:								
Yield Tensile Strength 5 mm/min (0.2 in/min) rate	527	D 638	26.9	MPa	3900	psi	274	kg/cm ²
Ultimate Tensile Strength 5 mm/min (0.2 in/min) rate	527	D 638	25.5	MPa	3700	psi	260	kg/cm ²
Ultimate Elongation 5 mm/min (0.2 in/min) rate	527	D 638	40	%	40	%	40	%
Tensile Modulus 5 mm/min (0.2 in/min) rate	527	D 638	2365	MPa	343,000	psi	24113	kg/cm ²
Flexural Properties 1.3 mm/min (0.05 in/min) rate								
Flexural Strength (3-point)	178	D 790	56.5	MPa	8200	psi	577	kg/cm ²
Flexural Modulus (3-point)	178	D 790	2606	MPa	378,000	psi	26573	kg/cm ²
Generic Properties								
Rockwell Hardness, R-scale	2309/2	D 785	110		110		110	
Flammability Properties ⁽³⁾								
UL 94 Classification:								
@1.47 mm (0.058 in) thickness			HB		HB		HB	

1) When used unmodified for the manufacture of food contact articles, STYRON® 421 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

The Americas Styrenics LLC and its subsidiaries 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 LLC products — from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

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

Medical Applications Policy

Americas Styrenics LLC 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.

- For the products sold by the Americas Styrenics LLC, new business opportunities require a business assessment prior to sale or sampling of Americas Styrenics LLC products.
- Authorized distributors and resellers will adhere to this medical policy.
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