

Product Data Sheet



D7055.04 *Developmental Rubber Modified Impact Polystyrene*

Typical Applications	Features
<ul style="list-style-type: none"> Displays and retail product shelving Durable household applications Thin to medium thickness parts that require a combination of high flow and good toughness 	<ul style="list-style-type: none"> Excellent flow characteristics Medium gloss Balance of good impact and viscosity Broad processing window

Property ¹	Condition	English ²	Units	SI ²	Units	Thickness	ASTM
Melt Flow Rate	200 °C 5.0 kg	12.0	g/10 min	12.0	g/10 min		D1238
Tensile Strength	2.0 in./min	3,500	psi	24	MPa	0.125 in	D638
Tensile Elongation	2.0 in./min	45	%	45	%	0.125 in	D638
Notched Izod Impact	73 °F	1.8	ft-lb/in	96	J/m	0.125 in	D256
Vicat Softening Temp.	Rate B	205	°F	96	°C	0.250 in	D1525
Linear Mold Shrinkage	24 hours	0.004 – 0.008	in/in	0.004 – 0.008	mm/mm		D955
Specific Gravity		1.03					D792
Bulk Density		38-42	lbs/ft ³				

¹Physical properties were determined on specimens at 23 °C (73 °F) and 50% relative humidity unless otherwise specified.

²Typical values indicate median laboratory results and are listed as general reference information, not material specification limits.

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FDA

Americas Styrenics EA3000 natural complies with U.S. Food Additive Regulation 21 CFR 177.1640 for polystyrene and rubber modified polystyrene, which states that such materials may be used in articles that contact foods, subject to any limitations described in the regulations. The regulation and specific Americas Styrenics certification letters should be consulted for full details.

MEDICAL APPLICATION CAUTION:

Do not use this Americas Styrenics material in medical applications involving permanent implantation in the human body or permanent contact with internal body fluids or tissues.

Do not use this Americas Styrenics material in medical applications involving brief or temporary implantation in the human body or contact with internal body fluids or tissues unless the material has been provided directly from Americas Styrenics or by an authorized or approved Americas Styrenics distributor under a contract which expressly acknowledges the contemplated use.

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Typical Molding Machine Settings

Zone	SI Conditions	Conditions
Nozzle	213 - 243 °C	415 - 470 °F
Zone #1	218 - 249 °C	425 - 480 °F
Zone #2	218 - 249 °C	425 - 480 °F
Zone #3	199 - 213 °C	390 - 415 °F
Backpressure	2 - 12 bar	25 - 175 psi

Mold Temperatures

High mold temperatures produce higher surface gloss and minimize flow marks and weld lines. Orientation is also reduced, thereby improving the properties of the part. However, high mold temperatures can require longer cycles in order to set up the polymer. Low mold temperatures are used for faster cycles. The parts will lack gloss, have poorer weld lines and a higher level of molded-in stress. Recommended mold surface temperatures for polystyrene range from 60° to 150° F. Use the highest temperature possible where you can maintain the desired cycle time.

Feed

The feed control should be adjusted to equal the desired shot weight. A general rule of molding parts with a minimum amount of internal stress and free of sink marks is to adjust the feed to keep the plunger from bottoming out. The feed should be adjusted to give a cushion of about ¼ inches. A larger cushion should be used only if the material contains moisture, air and/or excessive volatile content that show up as silver or black streaks in the molded part.

Fill Rate

Fast fill rates generally provide better uniformity in part size and quality. Rapid fill rates are possible if gate sizes and locations are properly selected. Gates too small for a particular part thickness can cause problems when filled at rapid speeds. Use the fastest fill rate the mold design and part will tolerate understanding that not all applications can tolerate a fast fill rate. Heavy section parts require a slow fill to avoid flow and weld marks on the surface of the part.

Screw Forward

Screw forward time should be controlled to prevent the plastic from flowing into or back from the cavity. Screw forward time is a function of mold and material temperature, part thickness, gate and runner size. Decreasing screw forward time increases part shrinkage. Allowances must be made in the screw forward time and hold pressure to minimize shrinkage and sink marks. Excessive screw forward time can over-pack the runner system or sprue, causing sticking.

Extrusion

Zone	SI Conditions	Conditions
Zone #1	177 - 193 °C	350 - 380 °F
Zone #2	182 - 204 °C	360 - 400 °F
Zone #3	188 - 210 °C	370 - 410 °F
Zone #4	199 - 216 °C	390 - 420 °F
Zone #5	204 - 221 °C	400 - 430 °F
Zone #6	204 - 221 °C	400 - 430 °F
Melt Pump, Adapter, Pipes, Screen Changer	193 - 232 °C	380 - 450 °F
Die	199 - 232 °C	390 - 450 °F
Polish Rolls	66 - 104 °C	150 - 220 °F
Melt Temp.	193 - 232 °C	380 - 450 °F
Head Pressure	10 - 21 MPa	1500 - 3000 psi

Extrusion Conditions

A lower temperature value within the typical temperature range denotes usage of the material with a styrene butadiene block copolymer in impact-modified blends.

A screw design with a mixing head and a compression ratio of roughly 4:1 or a static mixing device is recommended for proper dispersion when using colorants or other additives.

The extruder die should be set from 110 - 150% of the required sheet thickness. The first polish roll gap should be set roughly 95% of the finished sheet thickness while the second polish roll gap can be set greater than or equal to 100% of the sheet thickness depending on what surface needs to be imparted upon the sheet by the final roll.

For all polystyrene products except OPS, the sheet orientation should not exceed 30%. Brittleness and tear strength of the sheet, especially in the machine direction, is drastically deteriorated at orientation levels >30%.

Recommended temperatures are typical ranges only.