Acrylonitrile Butadiene Styrene ABS 400FR

Acrylonitrile Butadine Styrene alloys can be tailored to meet the requirements of a wide range of end-use application demands.

ABS 400FR is a flame retardent composition which, when tested to UL94 flammability methods meets V-O requirements in thickness of 1.6mm and above.

This formulation combines good toughness as well as strength and rigidity with V-O properties.

TYPICAL PROPERTIES
DRY AS MOLDED

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Vicat Softening Point	D1525	ºF	215	ºC	102
Specific Gravity	D792	-	1.04	-	1.04
Water Absorption (24 hours immersion)	D570	%	0.3	%	0.3
Heat Deflection Temperature at 66 lbs/in^2 (0.45 Mpa)	D648	ºF	183	ºC	84
Mold Shrinkage Guideline* (Flow Direction)	1/8" section	%	0.6-0.8	%	0.6-0.8
Tensile Strength at Yield	D638	lbs/in^2	6,100	MPa	42
Elongation at Break	D638	%	15-20	%	15-20
Flexural Strength	D790	lbs/in^2	9,200	MPa	63
Flexural Modulus	D790	lbs/in^2	312,000	MPa	2,151
Izod Impact Strength (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	4.0	J/m	212
Rockwell Hardness	D785	R scale	R98	-	-

***Please review shrinkage projections for specific applications with an MDE Technical Representative.**

All data generated using test specimens injection molded from natural color material. Inclusion of color pigments or other additives may change some or all of these test results. Tests are conducted at 23ºC and 50% relative humidity unless otherwise stated.

These mechanical property test data have been developed using injection molded specimens tested under standardized conditions; furthermore, many of the mechanical properties of thermoplastic materials can be influenced by changes in processing conditions, environmental factors such as temperature and humidity, and rate of application of stress. Therefore, these test results, which characterize typical production material, should not be used either to establish specification limits or alone as the basis for engineering design.

ABS400 FR
Processing Guidelines

Drying

Although ABS resins and compounds from MDE are shipped in moisture-resistant packaging, in order to realize best surface appearance, it is important that they are further dried before processing. The use of dehumidifying dryers is recommended. The dew point of the drying air stream should be no more than –20ºF, and preferably lower. The drying air temperature must be high enough to achieve a pellet temperature of at least 180ºF. If using a hopper dryer, depending on air hose length and insulation of hoses and hopper, the drying air temperature may need to reach 200-210ºF to achieve the required material temperature. Insulation of hoses and especially the hopper is strongly recommended.

If the material temperature reaches 180ºF, a residence time of 2 hours at this temperature is generally adequate to ensure that the material is ready to be processed. Drying times should not exceed 4 hours to avoid any risk of thermal degradation. Note that dried material should be used within an hour, particularly in humid weather conditions; longer exposure times will usually result in a need to re-dry. If moisture analysis equipment is available, the acceptable maximum moisture content for ABS resins and compounds is 0.01%.

Temperature Guidelines

The following temperature guidelines are suggested for general use **if a machine can be selected where shot size is 40-70% of nominal machine capacity.**

Tool Surface	Melt Temperatures (ºF)			Typical Cylinder Temperatures (ºF)		
Temperature (ºF)	Max.	Preferred	Min.	Front	Center	Rear
100-140	525	470-490	425	480	470	460

- Melt temperatures at the higher end of the range have been used successfully to help flow in very thin sections, provided cylinder residence times are short.
- A mold surface temperature in the suggested range improves surface appearance, helps consistency of mold fill and therefore consistency of dimensions, minimizes the effect of weld lines and helps realize best molded part performance.
- A medium to fast injection speed maximizes weld line strength and minimizes molded-in stress. Good venting of cavities is essential to allow fast fill without burning.

Screw Forward Time

Adequate screw forward time under follow-up pressure is especially important to ensure proper packing before gate freeze, during which time it is essential to maintain a "cushion" of 1/8". Optimum screw forward time can be judged by a part weight vs. forward time plot. Avoid over packing, which by generating molded-in stresses will adversely affect part performance.

Screw Recovery

It is recommended that back pressures of 200-250 p.s.i. gauge be used to ensure uniformity of the melt, and to help ensure a consistent "cushion." Screw rotation should also be as slow as possible consistent with cycle time goals, usually 40-80 r.p.m.

Mold Shrinkage

Standard ASTM test specimens are used to develop shrinkage guidelines. Test specimens are end-gated, 1/8 inch thickness, and molded at conditions recommended for this formulation. **Actual shrinkage in molded parts will depend on several variables including processing conditions, part configuration and gate location, both of which influence material flow direction, and wall section thickness.**