Acrylonitrile Butadiene Styrene ABS 500L

One of the first commercial polymer alloy products, acrylonitrile butadiene styrene compounds can be tailored to meet the requirements of a very wide range of end-use application demands.

Of the family of ABS molding grades, **ABS 500L** is a general-purpose formulation combining excellent toughness with high strength and rigidity.

ABS resins in general offer an unusually broad latitude in processing conditions; **ABS 500L** molds easily to give parts of exceptional surface appearance.

TYPICAL PROPERTIES

PROPERTY	ASTM TEST METHOD	ENGLISH UNITS	ENGLISH VALUE	S.I. UNITS	S.I. VALUE
Vicat Softening Point (Condition A)	D1525	°F	221	°C	105
Specific Gravity	D792	-	1.04	-	1.04
Water Absorption (24 hours immersion)	D570	%	0.3	%	0.3
Heat Deflection Temperature at 264 lbs/in^2 (1.82 MPa)	D648				
1/8" specimen thickness as molded		°F	176	°C	80
annealed		°F	216	°C	102
Mold Shrinkage Guideline (Flow Direction)	1/8" section	%	0.6-0.8	%	0.6-0.8
Tensile Strength at Yield	D638	lbs/in^2	7,000	MPa	48
Elongation at Break	D638	%	10-20	%	10-20
Flexural Strength	D790	lbs/in^2	11,000	MPa	76
Flexural Modulus	D790	lbs/in^2	370,000	MPa	2,551
Izod Impact Strength (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	4.0	J/m	213
Rockwell Hardness	D785	R scale	R105	-	-

***Please review shrinkages 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 23°C 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.

ABS500L
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 drier, 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 redry. 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 Temperature (ºF)	Melt Temperatures (ºF)			Typical Cylinder Temperatures (ºF)		
	Max.	Preferred	Min.	Front	Center	Rear
100-120	525	470-480	425	475	465	450

- 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 low back pressures of 50 p.s.i. gauge be used to help development of an homogeneous melt, and ensure a consistent shot volume. 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.**