Developmental Product Information

Polycarbonate PC/ABS 1851G10L

PC/ABS 1851G10L is a polycarbonate/ABS blend that has been reinforced with 10% fiberglass by weight. The addition of fiberglass provides high tensile strength and rigidity while preserving optimum impact resistance. **PC/ABS 1851G10L** offers a viscosity suitable for general-purpose injection molding applications and is lubricated for ease of mold release.

Compared with unmodified and unreinforced polycarbonate, this alloy exhibits better chemicals resistance, and reduced dependence of notch sensitivity upon part thickness, as well as improved cost-effectiveness. The benefits of this alloy compared with conventional ABS are a substantial increase in toughness, tensile strength, rigidity, particularly at low temperatures, and improved higher temperature performance.

PC/ABS 1851G1OL exhibits easy processing characteristics. Drying of this compound is strongly recommended prior to processing, to optimize mechanical performance and surface appearance.

Preliminary Properties

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Vicat Softening Point	D1525	ºF	282	ºC	138
Specific Gravity	D792	-	1.24	-	1.24
Water Absorption (24 hours immersion)	D570	%	0.10	%	0.10
Heat Deflection Temperature at 264 lbs/in^2 (1.82 MPa)	D648	ºF	248	ºC	120
Mold Shrinkage Guideline* (Flow Direction)	1/8” section	%	0.3-0.5	%	0.3-0.5
Tensile Strength at Yield	D638	lbs/in^2	10,250	MPa	70.7
Elongation at Break	D638	%	2-3	%	2-3
Flexural Strength	D790	lbs/in^2	15,500	MPa	107
Flexural Modulus	D790	lbs/in^2	550,000	MPa	3793
Izod Impact Strength (Notched, 1/8” specimen)	D256	ft. lbs/in of notch	2.0	J/m	106

***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 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.

PC/ABS 1851G10L
Processing Guidelines

Drying
Although polycarbonate/ABS alloys from MDE are shipped in moisture resistant packaging, in order to realize best mechanical performance and surface appearance it is critical that they are further dried before processing.

The use of dehumidifying dryers is strongly 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 200ºF. If using a hopper dryer, depending on air hose length, and insulation of hoses and hopper, the drying air temperature may need to reach 210-220ºF to achieve the required material temperature. Insulation of hoses and especially the hopper is strongly recommended. If the material temperature reaches 200ºF, a residence time of 4 hours is generally adequate to ensure that the material is ready to be processed. If residence times are shorter, material temperatures should be increased to 220ºF, which will normally ensure adequate drying within two hours.

Note that while high moisture levels will usually result in visual evidence in molded parts such as splay or silver streaking, it is possible to satisfactorily process material and make parts of acceptable appearance, even though its moisture content is high enough to seriously diminish mechanical performance.

If moisture analysis equipment is available, then acceptable maximum moisture content for polycarbonate/ABS alloys is 0.02%.

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
180-200	520	480-500	440	500	490	480

- Melt temperatures over 500ºF have been used successfully to further help flow in thin section or long flow-path tools, 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 also helps realize best molded part performance.
- A medium to fast injection speed maximizes weld line strength, minimizes molded-in stress, and also assures achievement of best surface gloss. Good venting of cavities is essential to allow fast fill without burning.

Screw Forward Time
Adequate screw forward time under follow-up pressure is important to ensure proper packing before gate freeze, during which time it is essential to maintain a "cushion" of 1/8"-1/4". Optimum screw forward time can be judged by a part weight vs. forward time plot. Avoid overpacking, which can generate molded-in stresses.

Screw Recovery
Low back pressures - nominal 50-100 psi gauge - is normally sufficient to help development of a homogenous melt, and to ensure 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 will be used to develop these 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.**