Thermoplastic Polyester RPBT800G30HSL VO

RPBT800G30HSL VO is a higher flow version of polybutylene terephthalate (thermoplastic polyester) compound, reinforced with 30% glass fiber and containing an especially effective flame retarding package designed to comply with the V-O* requirements of U.L. Bulletin 94 at section thicknesses as low as 0.030 inches. Combining excellent strength and rigidity with outstanding dimensional stability and electrical insulation characteristics, and resistance to a wide range of chemicals and solvents, **RPBT800G30HSL VO** is used extensively for a wide range of applications in the electrical/electronics, communications and appliance industries, where this exceptional property profile, complimented by extremely easy processing and fast cycling, has made this material the primary choice.

TYPICAL PROPERTIES

	ASTM	ENGLISH		S.I.	
PROPERTY	**TEST METHOD**	**UNITS**	**VALUE**	**UNITS**	**VALUE**
Melting Point	D789	ºF	442	ºC	228
Specific Gravity	D792	-	1.68	-	1.68
Water Absorption (Immersion to Equil. at 23ºC/73ºF)	D570	%	0.25	%	0.25
Heat Deflection Temperature at 264 lbs/in^2 (1.82 MPa)	D648	ºF	401	ºC	205
Mold Shrinkage Guideline (Flow/Transverse Direction)	1/8" section	%	0.3/0.7	%	0.3/0.7
Tensile Strength at Break	D638	lbs/in^2	20,000	MPa	138
Elongation at Break	D638	%	1-2	%	1-2
Flexural Strength	D790	lbs/in^2	28,000	MPa	186
Flexural Modulus	D790	lbs/in^2	1,250,000	MPa	8,620
Izod Impact Strength (Notched, 1/8" specimen)	D256	ft. lbs/in of notch	1.25	J/m	67
Rockwell Hardness	D785	M scale	90	-	-
Dielectric Strength	D149	Volts/.001"	400	-	-
Hot Wire Ignition	UL746A	PLC code	1	-	-
High Current Arc Ignition	UL746A	PLC code	0	-	-
High Volt Track Rate	UL746A	PLC code	4	-	-
Arc Resistance	D495	PLC code	5	-	-
Comparative Tracking Index	UL746A	PLC code	2	-	-
Volume Resistivity	D257	Ohm-cms	>5.25x10^{16}	-	-
Surface Resistivity	D257	Ohms	3.0x10^{15}	-	-

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.

*This laboratory rating of flammability characteristics is not intended either to predict behavior or to reflect hazards that may be presented by this or any other material under actual fire conditions.

RPBT800G30HSL V0 Processing Guidelines

Drying

Although Thermoplastic Polyester (PBT) compounds from MDE are shipped in moisture resistant packaging, drying before processing is strongly recommended to ensure full realization of part performance, especially toughness. PBT absorbs very little moisture from its surrounding environment, but hydrolysis of the polymer when melted in the molding machine is rapid, causing breakdown of the polymer structure and loss of mechanical properties. Further, unlike other moisture sensitive engineering thermoplastics, such as nylon and polycarbonate, there may be no visible evidence (such as splay marking) of unacceptably high moisture levels.

The use of dehumidifying hopper dryers is therefore strongly recommended to ensure that both virgin material and regrind are properly dried. The dew point of the drying air stream should be no more than -20ºF, and preferably lower. The drying air temperature required varies with residence time of the material in the hopper at the drying temperature.

Residence Time	Temperature
2-3 hours	260-280ºF(Max)
5-6 hours	230-240ºF
8 hours-overnight	215ºF

If equipment is available to analyze moisture content, the maximum recommended level is 0.05%. PBT can be processed without difficulty at levels of 0.1%, but some loss of mechanical properties and part performance will occur.

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
170-200	520	480-500	470	470	480	490

- A "reverse" temperature profile helps ensure a homogeneous melt, improves screw recovery and by accelerating the transition from solid pellets to a melt significantly reduces abrasive wear on screw and barrel surfaces.
- 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 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

Although PBT compounds “set up" very rapidly, 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

It is recommended that back pressures of 50 p.s.i gauge to used to help development of a homogeneous melt, and to ensure consistent shot volume, while minimizing the risk of mechanical damage to the glass fibers with consequent loss of part performance. 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.**