PREMIER™ PBT-225

Hydrolysis Resistant Conductive Plastic

Customer Value Proposition:

Parker Chomerics **PREMIER™ PBT-225** is a single pellet, polybutylene terephthalate (PBT) based, electrically conductive plastic that delivers superior reliability, making metal to plastic housing conversions possible for demanding electronics applications.

PBT-225 is specially formulated to **deliver excellent hydrolysis resistance,** thereby improving long term aging performance when exposed to typical heat and humidity conditions found on automotive applications.

The single pellet composition of PBT-225 provides a more reliable solution to traditional two pellet blend (also known as "salt and pepper blend") conductive resin systems. The easy processing of PBT-225 allows for uniform filler dispersion and, as a result, tightly controlled electrical and mechanical performance throughout complex geometries.

The improved hydrolysis resistance, electrical properties and manufacturability of PBT-225 makes it a superior choice for plastic housing.

Product Features:

- Single pellet composition eliminates inconsistent mix ratio problems associated with multi pellet blends
- Long stainless steel fiber increases shielding effectiveness
- Glass fiber reinforcement enhances mechanical strength
- Uniform shielding in complex geometries
- No weighing or mixing of materials required
- Hydrolysis resistant PBT
- Improved pellet integrity optimizes material conveyance
- Sustainable product and process
- Consistent melt and mix ratio of ingredients eliminates harmful agglomerations

Typical Applications:

- Automotive Electronic Housings
- Connector Bodies
- Motor Housings
- Sensor Housings
- Infotainment Enclosures
- Military Handheld Devices
- Industrial Metering Devices
- Faceplates
- Base Stations
- Military Housings
- Life Science Enclosures
- Telecom Equipment
- IT Rack and Server Components
- Heavy Duty Connectors
- Renewable Energy Housings and Connectors

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PREMIER™ PBT-225 Properties

PBT-225 is formulated to be hydrolysis resistant when exposed to heat and humidity which can extend the service life of the component or assembly.

Laboratory testing demonstrated in Figure 1 highlights the improvement in the retention of tensile strength after 2400 hour exposure to 85° C and 85% R.H.

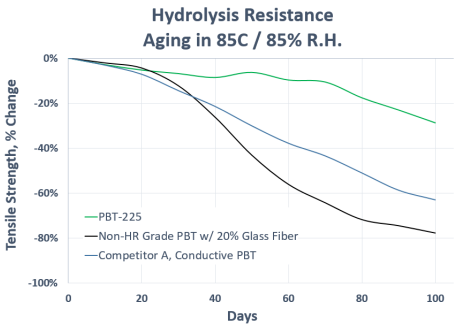

Figure 1 - Typical Hydrolysis Resistance

Table 1 - Typical PBT-225 Properties

	Value	Test Method	Nominal Value (English)	Unit	Nominal Value (SI)	Unit
Shielding Effectiveness	Average from: 30 to 1,500 MHz* 800 to 4,000 MHz** 6,000 to 12,000 MHz** 14,000 to 18,000 MHz** 20,000 to 40,000 MHz**	*ATSM D4935 **IEEE 299 (Modified)	40 40 55 70 80	dB	40 40 55 70 80	dB
Physical	Specific Gravity	ASTM D792	1.66	--	1.66	--
	Mold Shrinkage 0.125 in (3.2 mm)	ASTM D995	0.005	in/in	0.5	%
Mechanical	Tensile Modulus	ASTM D638	1.33×10^6	psi	9.2	GPa
	Tensile Strength @ Break	ASTM D638	11,889	psi	89	MPa
	Tensile Elongation @ Break	ASTM D638	1.89	%	1.89	%
	Flexural Modulus	ASTM D790	1.13×10^6	Mpsi	7.8	GPa
	Flexural Strength	ASTM D790	16,060	psi	111	MPa
Impact	Izod - Notched 73° F (23° C)	ASTM D256	0.78	ft-lb/in	4.25	cm-kg/cm
	Izod - Unnotched 73° F (23° C)	ASTM D4812	5.76	ft-lb/in	31.35	cm-kg/cm
Thermal	HDUL @ 264 psi (1.82 MPa)	ASTM D648	382	° F	200	° C
	Thermal Conductivity	ASTM D5470	0.65	W/m-k	0.65	W/m-k
	Flammability Rating	UL 94 HB	Pass	--	Pass	--
Electrical	Surface Resistance	MIL-DTL-83528C	10	Ohm/sq	10	Ohm/sq
	Through Resistance	PRE-012	2.95	Ohm	2.95	Ohm

Part Number	Standard Container Sizes
CP-PBT-225	55, 275 & 1100 LBS box
CK-PBT-225	25, 125 & 500 KGS box

www.chomerics.com
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PREMIER™ PBT-225
Recommended Processing Guideines

General

Parker Chomerics PREMIER™ PBT-225 is a single pellet, polybutylene terephthalate (PBT) based, electrically conductive plastic that delivers superior reliability, making metal to plastic housing conversions possible for demanding electronics applications.

PBT-225 was specifically developed to provide a more reliable solution to traditional cube blend (also known as 'salt and pepper blend') conductive resin systems and provide a more efficient alternative to metal and non-conductive plastic housings. The cutting edge processing of PBT-225 into a single pellet composition allows for uniform material dispersion and a tightly controlled conductive material ratio throughout complex geometries, delivering a matrix of polymer and conductive filler.

Table 1 - Processing Parameters

Drying Temperature	°F (°C)	250 (121)
Drying Time, Typical	hours	4
Drying Time, Maximum	hours	12
Suggested Maximum Moisture	%	0.02
Rear Temperature	°F (°C)	485-515 (252-268)
Middle Temperature	°F (°C)	485-515 (252-268)
Front Temperature	°F (°C)	490-520 (254-271)
Nozzle Temperature	°F (°C)	490-520 (254-271)
Processing (Melt) Temperature	°F (°C)	490-520 (254-271)
Mold Temperature	°F (°C)	100-140 (38-60)
Back Pressure	Psi (bar)	100 (6.9)
Screw Speed	RPM	100
Clamp Pressure	tons/in^2 (MPa/cm^2)	3-5 (41-69)
Cushion	inch (mm)	0.2 (5.08)

Process Guidelines

1. Higher back pressure is suggested to promote homogeneous fiber distribution, consistent shot size, and improved surface appearance.
2. Screw speed should be adjusted so that the screw is rotating during the entire cooling cycle.
3. PREMIER PBT-225 performs well with a standard nozzle and typically a 5/32" "O" diameter can be used for parts that have 1/16" – 1/8" thick wall sections.
4. Residence time in the barrel should be kept as short as possible. Although not mandatory, hot runner systems with valve gates can be used for cost control through process scrap reduction and elimination of secondary de-gating.
5. Short fill times are recommended. Fast fill speeds will provide longer flow, fill thinner wall sections, and give better knit line strength.
6. Colder mold temperatures will facilitate better migration of fiber to the surface of the part. This will improve surface conductivity, thereby promoting better grounding and improved shielding effectiveness.

Processing Benefits

- No dry blending = No weighing and High machine up time
- Processing similar to non-conductive systems
- Environmentally friendly and recyclable
- Global supply
- High EMI shielding at a low cost
- Consistent high part yield

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THE RECIPIENT OF THIS DOCUMENT, THROUGH ITS OWN ANALYSIS AND TESTING IS SOLELY RESPONSIBLE FOR MAKING THE FINAL SELECTION OF THE APPLICABLE SYSTEM AND COMPONENTS AND ASSURING THAT ALL PERFORMANCE, ENDURANCE, MAINTENANCE, SAFETY AND WARNING REQUIREMENTS OF THE APPLICATION ARE MET.

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