LANXESS
Energizing Chemistry

Processing of Pocan® PBT Thermoplastic Polyester Resin

Product Information

Description

Pocan thermoplastic polyester resin is a semi-crystalline material based on polybutylene terephthalate (PBT) polymers. It offers good dimensional stability, excellent mechanical strength, high rigidity, good electrical properties, high heat deflection temperature, and broad chemical resistance. Pocan resin is well-suited for electrical, automotive, appliance, and industrial applications. As with any product, use of Pocan resin in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Note: This brochure only covers standard Pocan PBT materials. Please refer to the individual Pocan data sheet for blends of PBT and other materials.

Drying

All Pocan PBT resin grades should be dried to a moisture content of 0.05% or less prior to processing to ensure desired property performance. A dehumidifying hopper dryer is preferred with an outlet air temperature of 250°F (120°C) and a dew point of 0°F (-18°C) or less. Drying time is 2–4 hours minimum, depending upon ambient air conditions. If oven drying is used, it should be a dehumidifying type and for predrying only. Recommended resin depth is 1 in (2.54 cm) maximum in shallow trays. The resin should be transferred to the molding machine dehumidifying hopper dryer, without delay, to avoid moisture absorption. ***Oven drying is not recommended for high-humidity climates.*** Do not dry Pocan PBT resin in bags, cans, or boxes.

Processing

Typical processing parameters are noted below. Actual processing conditions will depend on machine size, mold design, material residence time, shot size, etc.

Please note that these processing conditions only cover standard Pocan PBT materials. Pocan PBT Blends may require modification to these conditions. Please refer to the individual data sheet for processing of Pocan PBT Blends.

Melt temperatures in excess of 500°F (260°C) can cause polymer degradation and generate fumes which may be irritating and/or toxic. Typical mold start-up temperature is 180°F (80°C).

Typical Injection Molding Start-Up Conditions

Barrel Temperatures:	
Rear	455°–470°F (235°–245°C)
Middle	470°–490°F (245°–255°C)
Front	480°–500°F (250°–260°C)
Nozzle	480°–500°F (250°–260°C)
Melt Temperature	460°–500°F (240°–260°C)
Mold Temperature	160°–250°F (70°–120°C)
Injection Pressure:	
Unreinforced	10,000–12,000 psi
Reinforced/Filled	10,000–18,000 psi
Hold Pressure	50–75% of Injection Pressure
Back Pressure	30–60 psi (206–413 kPa)
Screw Speed	45–75 rpm
Injection Speed	High
Cushion	1/4 in max
Clamp	2–4 ton/in^2

Prior to introducing Pocan resin, the molding machine should be purged of residual material with polyolefins or polystyrene, bringing the cylinder temperature down to 450°–490°F (230°–255°C). Avoid contaminating Pocan PBT resin with nylon, polyethylene terephthalate (PET), or polycarbonate to minimize molding problems and maintain polymer integrity. Mixing even small amounts of PET and PBT resins may result in a chemical reaction (transesterification) that can significantly reduce property performance of the major constituent.

Short interruptions, 15 minutes or less, in the Pocan resin injection molding cycle can usually be tolerated with purging. To avoid decomposition during extended inactivity, Pocan resin should not be left in the machine.

Regrind Usage

Where end-use requirements permit, up to 20% Pocan resin regrind (10%–15% for flame-retardant grades) may be used with virgin material during injection molding, provided that the material is kept free of contamination and is properly dried (see section on Drying). Any regrind used must be generated from properly molded parts, sprues, and/or runners. All regrind used must be clean, uncontaminated, and thoroughly blended with virgin resin prior to drying and processing. Under no circumstances should degraded, discolored, or contaminated material be used for regrind. Materials of this type should be discarded.

Improperly mixed and/or dried regrind may diminish the desired properties of Pocan resin. It is critical that you test finished parts produced with any amount of regrind to ensure that your end-use performance requirements are fully met. Regulatory or testing organizations (e.g., UL) may have specific requirements limiting the allowable amount of regrind. Because third party regrind generally does not have a traceable heat history or offer any assurance that proper temperatures, conditions, and/or materials were used in processing, extreme caution must be exercised in buying and using regrind from third parties.

The use of regrind material should be avoided entirely in those applications where resin properties equivalent to virgin material are required, including but not limited to color quality, impact strength, resin purity, and/or load-bearing performance.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, *e.g., material safety data sheets and product labels.* Consult your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS.

Note: The information contained in this publication is current as of May 2005. Please contact LANXESS Corporation to determine whether this publication has been revised.

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