

MAKROLON® 8325

Product Information

Polycarbonate Resin

Glass-Fiber-Reinforced Grade

Description

Makrolon 8325 polycarbonate resin is a 20% glass-fiber-reinforced grade which provides a balance of stiffness and high strength. Compared with unreinforced polycarbonate, Makrolon 8325 offers lower mold shrinkage, greater dimensional stability, a higher modulus of elasticity, and a higher heat deflection temperature. Although it does not contain a flame retardant, it has a UL94 flammability rating* of V-0 at 3.0-mm thickness in natural and black colors. This resin contains an internal mold release additive. It is opaque and is available in natural and selected colors, and with special visual effects.

Applications

Makrolon 8325 resin is used in applications where rigidity, dimensional stability, and heat resistance are required. Potential applications include camera, business machine, and water meter housings; switch and fuse boxes; load-bearing components for electrical instruments; and a variety of telecommunications applications, including card guides. As with any product, use of Makrolon 8325 resin in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Drying

All polycarbonate resins are hygroscopic and must be thoroughly dried prior to processing. A desiccant dehumidifying hopper dryer is recommended. To achieve a moisture content of less than 0.02%, hopper inlet air temperature should be 250°F (121°C) and inlet air dew point should be -20°F (-29°C) or lower. The hopper capacity should be sufficient to provide a minimum residence time of 4 hours. Additional information on drying procedures is available in the Bayer brochure *General Drying Guide*.

Processing

Makrolon 8325 resin can be processed on commercially available equipment suitable for injection molding of polycarbonate. Typical processing parameters are noted below. Actual processing conditions will depend on machine size, mold design, material residence time, shot size, etc.

Typical Injection Molding Conditions

Barrel Temperatures:	
Rear	520°–560°F (271°–293°C)
Middle	540°–580°F (282°–304°C)
Front	555°–595°F (291°–313°C)
Nozzle	555°–595°F (291°–313°C)
Melt Temperature	570°–600°F (299°–316°C)
Mold Temperature	150°–220°F (66°–104°C)
Injection Pressure	10,000–20,000 psi
Hold Pressure	50–70% Injection Pressure
Back Pressure	50–75 psi
Screw Speed	50–75 rpm
Injection Speed	Moderate to Fast
Cushion	1/8–1/4 in
Clamp	3–5 ton/in ²

Additional information on processing may be obtained by consulting the Bayer publication *Makrolon Polycarbonate — A Processing Guide for Injection Molding* and by contacting a Bayer MaterialScience technical service representative.

* Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

Regrind Usage

Where end-use requirements permit, up to 20% Makrolon resin regrind may be used with virgin material, 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 properly discarded.

Improperly mixed and/or dried regrind may diminish the desired properties of Makrolon 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.

General Characteristics of Polycarbonate

Hydrolytic Stability. Parts molded from polycarbonate absorb only 0.15 to 0.19% water at room temperature and 50% relative humidity. Dimensional stability and mechanical properties remain virtually unaffected. Even with immersion in water, dimensional changes measure only about 0.5%. Although frequent, intermittent contact with hot water does not harm polycarbonate, continuous exposure to humidity or water at high temperatures (>140°F/60°C) is not recommended due to hydrolytic degradation, which reduces impact strength and tensile properties.

Gas Permeability. Steam permeability, measured on 100- μ m thick film, is 15 g/m²·24 h (0.97 g/100 in²·24 h). Significant permeability also exists for other gases, such as hydrogen, carbon dioxide, sulfur dioxide, helium, ethylene oxide, and oxygen.

Chemical Resistance. Polycarbonate is resistant to mineral acids (even in high concentrations), a large number of organic acids, many oxidizing and reducing agents, neutral and acidic saline solutions, some greases and oils, saturated aliphatic and cycloaliphatic hydrocarbons, and most alcohols. It is important to note that polycarbonate is degraded by alkaline solutions, ammonia gas and its solutions, and amines. Polycarbonate dissolves in a number of organic solvents, such as halogenated hydrocarbons and some aromatic hydrocarbons. Other organic compounds cause polycarbonate to swell or stress-crack, e.g., acetone and methyl ethyl ketone. Since chemical resistance to various media is dependent on variables, such as concentration, time, temperature, part design, and residual stresses, the above information should serve only as a guideline. It is imperative that production parts be evaluated under actual application conditions prior to commercial use.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Makrolon 8325 resin. Before working with this product, you must read and become familiar with the available information on its 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 Bayer MaterialScience representative or contact Bayer's Product Safety and Regulatory Affairs Department in Pittsburgh, Pa.

Note: The information contained in this bulletin is current as of October 2003. Please contact Bayer MaterialScience to determine whether this publication has been revised.

