PROCESSING DATA SHEET ABS GLASS FIBER FILLED

PRODUCTS LIST

SICOFLEX S425 STANDARD GRADE 10% GLASS FIBER FILLED
SICOFLEX 1307 GF10 HIGH FLOW GRADE 10% GLASS FIBER FILLED
SICOFLEX S302 STANDARD GRADE 16% GLASS FIBER FILLED
SICOFLEX S299 HEAT RESISTANT GRADE 16% GLASS FIBER FILLED
SICOFLEX S358 STANDARD GRADE 30% GLASS FIBER FILLED

MATERIAL DESCRIPTION

SICOFLEX™ ABS resins reinforced with different level of glass fiber are specifically designed for injection molding applications where high rigidity and dimensional stability properties are required.

DRYING

ABS resins are hygroscopic; they absorb water from direct immersion and from humid air. The amount of water absorbed normally depends on the exposure time, the air temperature and the relative humidity.
At the temperatures used to mold ABS, moisture levels can cause visual flaws and also brittleness of the molded part.
Therefore, it is recommended that resin moisture content be limited to 0.1%

DRIYNG EQUIPMENT AND CONDITIONS

Hopper dryers that incorporate dehumidifying units are recommended for drying ABS resin granules. It is recommended 3-4 hours at 100℃ as minimum-drying conditions for ABS resins dried in dehumidifying dryers. Closed hot-air systems are not recommended for use. If tray dryers are used, the depth of the granules should not exceed 25 mm, and the granules should be heated at 110℃ for at least 4 to 6 hours, depending on the granule size.
Because dried granules of ABS resin can quickly pick up moisture from the air, it is good practice to use them as soon as possible after drying.

MACHINE SELECTION

The size of the machine to be used is determined by the volume of plastic required to fill the mold cavity. It is
good practice to keep the shot size of the machine between 30 and 85 percent of the total capacity. An optimum shot size is between 40 and 60 percent of the machine capacity.
There are three general guidelines for selection of the screw for an injection molding machine to be used with PC/ABS resins:
1. A minimum of 15:1 length-to diameter ratio.
2. A compression ratio between 1.5:1 and 3.0:1.
3. Use of a slip-ring type non-return valve with clearances of at least 3.2 mm

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MELT TEMPERATURE

The molding machine should be set up to deliver a melt temperature between 230 to 260°C, with an aim of 250°C. The optimum temperature profile depends on many variables such as the ratio of machine capacity to shot size, screw design, mold and part design, and cycle time. Reverse temperature profiles are used occasionally to compensate for improper screw design, to reduce machine amperage or torque requirements, and to compensate for machines with short L/D ratios.
Keeping a uniform melt temperature within recommended range is essential to ensure part performance and color matching to mating component parts. Melt temperatures in the upper end of the recommended range may be necessary when processing thin wall parts, difficult-to-fill parts, parts with very small gates, and parts with long flow lengths. Excessive melt temperatures may result in thermal degradation and a loss of performance, properties and aesthetics. Lower processing temperatures reduce the risk of thermal degradation and shorten the necessary cooling time. However, excessively low melt temperatures may result in high residual molded-in stress.

MOLD TEMPERATURE

The mold temperature range recommended for ABS materials is 40 to 70°C. Cooling time is important for part performance and cycle time optimization. Using a mold temperature controller will minimize temperature variations. Higher mold temperatures in the upper recommended range generally provide better surface finish, less molded-in stress because of slower cooling, and easier filling of thin wall parts and parts with long flow lengths. Lower mold temperatures allow the molten polymer to set up faster to reduce the overall cycle time. ABS resins with different glass fiber content have different processing windows. In general, resins having low glass fiber content allow the use of lower mold and melt temperatures.

PARAMETER VALUE

Barrel Temperatures :
Rear (Hopper) 220-230°C **;** Intermediate 230-240°C **;** Front 240-250°C **;** Nozzle 240-250°C

Mold Temperature : 40-70°C

Pressure :
Back Pressure 3.0-8.0 Bar
Injection Pressure Adjust to control part weight & dimensions
Hold/Pack Pressure 50-70 Bar
Cushion 3.0-6.0 mm

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Rate : Injection Speed Adjust to control appearance

Plasticizing Conditions :
A moderate screw speed of 30-60 RPM is recommended for ABS glass fiber filled resins.

Injection Conditions : the appropriate injection speed for ABS GF resins is determined largely by gate design. ABS resins are susceptible to formation of gate blush. For parts gated into a visible surface it may be necessary to run the machine at as slow an injection speed as possible.
During the packing phase, the material in the cavity is shrinking; to compensate for this shrinkage, additional material must be supplied to the cavity until gates freeze-off. A small melt cushion provides a ready source of additional melt to use during packing.
If the screw is allowed to "bottomout," the packing pressure cannot be transferred through the polymer to pack out the cavity. This will result in poor part consistency due to short shots, poor dimensional stability, excessive sink marks or poor aesthetics.
It is generally recommended that a small cushion size be employed to minimize heat history on the polymer, reducing the potential for polymer degradation.

REGRIND

Regrind can be used with ABS GF resins if care is taken to avoid cross contamination and moisture pick-up; like virgin resin, regrind must be dried. Large particle sizes of regrind may require longer drying times. However, parts that were rejected because they were molded with wet resin or degraded parts cannot be regrind and reused.

PURGING

Where exposure time at a high temperature will, or has been excessive it may be necessary to purge the barrel and nozzle. Purging will also be necessary for color or polymer changes. There are many purging
compounds available on the market.
Purge at the low end of the melt processing range being careful not to exceed the screw torque limit.
Alternatively a low melt flow rate GPPS, SAN or PMMA resin may be used.

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