PROCESSING DATA SHEET FLAME RETARDANT HIPS

MATERIAL DESCRIPTION

SICOSTIROLO™600 SERIE are HIPS resins V0 1.6 mm designed for injection molding of wide range of application where aestetichal properties combined with good impact and processability are required. Depending on the different composition it is possible to obtain different properties balancing (flammability, stiffness, flowability, heat resistance) depending on the application needs.

DRYING

HISP resins normally do not require 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 40 and 70 percent of the total capacity. An optimum shot size is between 50 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 HIPS resins:
1. A minimum of 15:1 length-to diameter ratio.
2. A compression ratio between 1.5:1 and 2.5:1.
3. Use of a slip-ring type non-return valve with clearances of at least 3.2 mm

MELT TEMPERATURE

The molding machine should be set up to deliver a melt temperature between 190 to 220°C, with an aim of 200°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 HIPS materials is 40 to 60°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. SICOSTIROLO™FR SERIE resins with different melt flow rates have different processing windows. In general, resins having higher melt flow rates allow the use of lower mold and melt temperatures. The higher melt flow rates are easier to process and their lower molding temperatures allow for shorter cycle times.

Processing

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PARAMETER VALUE

Barrel Temperatures :
Rear (Hopper) 190-200℃ **;** Intermediate 200-210℃ **;** Front 210-215℃ **;** Nozzle 205-210℃

Mold Temperature : 40-60℃

Pressure :
Back Pressure 3.0-6.0 Bar
Injection Pressure Adjust to control part weight & dimensions
Hold/Pack Pressure 30-50 Bar
Cushion 3.0-6.0 mm

Rate : Injection Speed Adjust to control appearance

Plasticizing Conditions :
A moderate screw speed of 40-60 RPM is recommended

Injection Conditions : the appropriate injection speed for SICOSTIROLO™FR 600 SERIE resins is determined largely by gate design. HIPS 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

The use of regrinded SICOSTIROLO™FR resins is generally **not** recommended

PURGING

It is mandatory to purge accurately barrel and nozzle at the end of the production or in case of production interruption (over 5 minutes) to avoid material degradation and consequent barrel damage or corrosion.
It is strongly recommended to cool as quickly as possible the purged material (putting it into a water bath), so to avoid the pyrolysis reaction with consequent smell and smoke generation.
Purging will also be necessary for color or polymer changes.
There are many purging compounds available on the market; alternatively a low melt flow rate GPPS, SAN or PMMA resin may be used.
Purge at the low end of the melt processing range being careful not to exceed the screw torque limit.

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