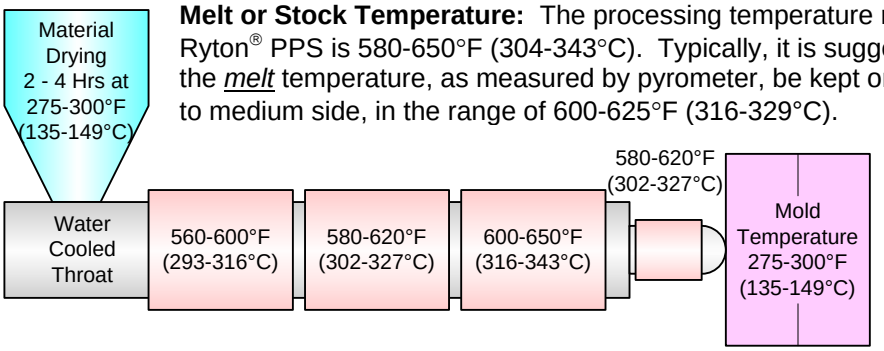
Ryton® PPS

INJECTION MOLDING

PROCESSING

Ryton® PPS compounds are easily processed on conventional reciprocating screw injection molding machines using standard molding practices for filled engineering plastics. Abrasion resistant materials are recommended to reduce wear incurred by the glass and mineral fillers. Maximum possible injection pressure is recommended to achieve optimum part packing. Heated molds are recommended to achieve sufficient crystallinity to ensure optimum high-temperature dimensional stability of the part. Listed below are general suggestions for injection molding Ryton® PPS compounds. Please contact our technical service staff if you have additional questions.



Melt or Stock Temperature: The processing temperature range for Ryton® PPS is 580-650°F (304-343°C). Typically, it is suggested that the *melt* temperature, as measured by pyrometer, be kept on the low to medium side, in the range of 600-625°F (316-329°C).

Mold Temperature: For a crystalline part, the mold temperature needs to be 275-300°F (135-149°C), and is best controlled by using circulated hot oil.

Equipment Requirements

- Abrasion Resistant Barrel (Xaloy 801)
- 16:1 to 20:1 L/D Screw with 2.5:1 Compression Ratio; Hardened Flights (Stellite or Colmonoy 6)
- Abrasion Resistant Ring type Check Valve
- Reverse Taper (Nylon Tip) or Automatic Positive Shut-Off Nozzle
- Mold Steel Rc 60 or Higher (A2 or D2)
- Shot Size 25-75%
- Clamp Tonnage 2.5-4.0 tons/in²

Material Drying

- Dry at 275°F to 300°F (135°C to 149°C) for 2 to 4 hours prior to processing.
- Hopper driers and/or desiccant driers are suggested, but not required; -40°F (-40°C) Dew Point recommended, if used.
- Moisture Content < 0.1%

Machine Settings

- See Barrel Temperature Profile Above
- Mold Temperature 275°F-300°F (135°C-149°C) recommended for optimum part crystallinity
- Back Pressure 50-100 psig (3.5-7.0 bar)
- Screw Speed 100 rpm
- Cushion 0.10-0.25 in (2.5-6.5 mm)

For more information and technical assistance contact::

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Another quality product from Chevron Phillips Chemical Company LP
The Woodlands, Texas

RYTON®
POLYPHENYLENE SULFIDE RESINS

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Injection Speed: A medium to fast fill speed should work well, depending on wall thickness. Typical fill time is in the range of 0.5 to 2.0 seconds for small to medium sized parts with larger parts possibly requiring longer fill times. If burning or flash occurs, check vents or reduce injection speed. Injection Pressure should be high enough to maintain the set injection speed.

Injection Boost Pressure: Set as high as required to achieve the injection speed set. Velocity control during injection part fill should be utilized with a transfer to pressure control for part pack and hold. This requires the Boost pressure to be set higher than the peak pressure required to fill, usually by several hundred psi. This should prevent pressure limiting the process.

Injection Pack/Hold Pressure: Should be set high enough to achieve maximum cavity pressure in the part. Typically set at 60 to 75% of peak injection pressure.

First Stage Timer: Switching on position or cavity pressure is suggested; typically 95 to 99% cavity fill. The first stage timer should be set slightly longer than the fill time.

Second Stage Timer: Typical Pack and Hold times required when processing Ryton® PPS compounds is in the range of 3 to 8 seconds for small to medium sized parts, and 8 to 12 seconds for larger or thicker walled parts. However, this is dependent on gate size, so inspect parts for sinks or porosity and check part weight at various hold times to get the proper setting. One or two pressure transducer(s) in a mold cavity typically provides the most accurate data for optimum part packing and gate freeze determination.

Cooling Time: Usually longer cooling times are required for Ryton® PPS compounds because of the hotter mold temperatures used. Most of the time 15 to 30 seconds is adequate for small to medium sized parts, with 30 seconds to a minute and up required for larger or thicker walled parts. Evaluate part sticking, wall distortion, flatness or dimensions for proper cooling time setting. Evaluate additional cooling time or wall draft for part sticking problems.

Screw Recovery: A screw recovery speed of 100 rpm is typically adequate to provide good mixing and fluxing of compounds. Most of the time a backpressure in the range of 50 to 100 psig hydraulic pressure should provide a good melt puddle with minimal screw and barrel wear. Some backpressure is desirable to stabilize the process and provide shot to shot consistency.

Barrel Purge: A Fractional Melt HDPE (Marlex® HHM 50100) or commercial high temperature purge compound is acceptable.

OFF-GAS PRODUCTS PRODUCED DURING PROCESSING CAN BE IRRITANTS TO THE MUCOUS MEMBRANES, THEREFORE ADEQUATE VENTILATION IS RECOMMENDED.

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