

## *Processing of Fluon<sup>®</sup> Filled PTFE Compounds*

### FILLED PTFE COMPOUNDS

AGC Chemicals Americas, Inc. Filled PTFE Compounds can be successfully processed using conventional PTFE manufacturing techniques. For best results, the following processing steps are suggested. For additional information, please refer to Technical Service Note F1, *The moulding of PTFE granular powders*.

### LOADING OF MOLD

Prior to molding, Filled PTFE Compounds should be stabilized for 24 hours above 68°F (20°C).

Filled PTFE Compounds Low Flow or non-pelletized (100 series) filled PTFE compounds formulations should be screened through a 10 mesh sieve as the mold is being filled. A stainless-steel whisk can be used to break up any large lumps seen in the drum. This product can be processed using compression molding equipment to mold thick-walled parts. For best results, filling the mold evenly is recommended.

Free Flow or pelletized (400 series) filled PTFE compounds formulations can be added directly to the mold cavity. This product can be processed using automatic molding equipment or manual compression mold tooling due to its high bulk density and flow properties. This product will flow from standard design gravity-fed hoppers and other bulk feeding equipment or can be loaded by hand using a stainless steel scoop.

Care must be exercised at all times to use clean and oil contaminant free tooling and limit the use of cleaning wipes free from organic or synthetic shedding fibers.

### MOLD SET-UP

For automatic molding process, the radial clearance between sliding punches for fill cavity depths of less than 1" should be between 0.002" – 0.003" (0.05 – 0.076 mm). For larger diameters and even greater fill depths, doubling the radial clearance is recommended but this requires tuning to a desired clearance since this controls how fast a mold can be properly vented in unison with the expected fast closure rate of the mold seen in this type of molding process.

For manual compression molding process, radial clearances should be between 0.015" - 0.030" (0.38 - 0.76mm). More clearance can be used however this will increase resin flash on the periphery of the molded part.

It is recommended the molding equipment be capable of applying slow, steady and uniform pressure during the ramp up, hold and decrease of pressure. Slow speeds are recommended for low flow products with a heavy wall.

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## PREFORMING

For Filled PTFE Compounds Low Flow or non-pelletized (100 series), apply pressure at a slow closing feed rate, gradually applying pressure to achieve a total of 3,000 to 4,000 psi on the desired mold area.

The mold radial clearance between sliding end rings or plugs should be between 0.020" – 0.040" (0.50 – 1.00 mm) depending on the mold diameter and quantity of resin loaded into a mold. This allows for the proper venting and release of trapped air generated during the compression phase of the molding process.

For Filled PTFE Compounds Free Flow or pelletized (400 series), apply pressure at a slow advance closing feed rate, gradually applying pressure to achieve a total of 4,500 to 10,000 psi on the desired mold area.

Mold wall thicknesses are required to be of sufficient strength to be able to withstand the maximum pressures being applied on the resin itself and limit the distortions or bulging during the molding phase minimizing further stress on the preformed part prior to decanting or stripping from the mold itself.

For the highly loaded formulations, best results will be obtained at the higher preform pressures.

## SINTERING

A properly vented circulating air oven is recommended.

All filled PTFE compounds materials are formulated to be free sintered. However, as in the case of any other PTFE compound, they can also be hot coined or pressure sintered.

- Place preform in cold oven and raise temperature to 590°F at approximately 200°F/hour.
- Hold at 590°F for 1 ½ hours per inch of part thickness.
- Raise to 685°F at a rate of 100°F/hour.
- Hold at dwell for 1 hour for every ½" of part thickness. A minimum dwell time of ½ hour is suggested.
- Cool at a rate of 50°F/hour down to 500°F.

Allow parts to return to room temperature.

## SAFE HANDLING INFORMATION

Heating Fluon® products in excess of 750°F (399°C) can produce toxic fumes. It is, therefore, necessary to provide local exhaust ventilation in areas where Fluon® products are exposed to high temperatures. Avoid breathing fumes or contaminating smoking tobacco with fumes, powder, or dust.

Thermal decomposition of this product will generate hydrogen fluoride, which is corrosive. Corrosion resistance materials are required for prolonged contact with molten resin.

A summary of the hazards, as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200 for this product are:

Physical hazards: None

Health hazards: None

FOR ADDITIONAL INFORMATION AND HANDLING INSTRUCTIONS READ AGC CHEMICALS AMERICAS, INC. MATERIAL SAFETY DATA SHEET.

### For more information and samples contact

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