



MOCOM

❖ Wic Processing Guide Injection Molding

WIC® PP is a semi crystalline thermoplast filled with carbon fibers.

As high-tech compounds, WIC products impress with their low weight (i.e. low density) combined with high strength and rigidity. The material is also dimensionally stable.

The basis of our WIC compounds is carbon fiber recycling. The fibers are sourced from offcuts from the industrial production of lightweight components, which are increasingly being used in the aerospace industry, medical technology and the automotive industry, for example. With our innovative carbon recycling technology, the carbon fiber residues are processed and homogeneously incorporated into carbon fiber compounds - a sustainable solution.

Pre-drying

Polypropylene is a non-hygroscopic polymer. Granules in their original packaging are protected from moisture and do not require any special treatment. Due to external influences such as climate or storage, moisture could condense on the surface of the granules, in which case

drying would be advisable. Storage at ambient temperature before processing minimizes the risk of condensation.

Processing

WIC® PP can be processed on all standard injection molding machines. Due to the carbon fiber filling, wear-protected plasticizing units are recommended. High processing and mold temperature can improve part quality of the PP compound, but attention should be paid to a short residence time of the melt in the plasticizing unit, among other factors. The exact temperature range for each material is mentioned on the according material datasheet.

During suction conveying of carbon compounds, abrasion in the form of plastic particles containing CF fibers can occur. This abrasion/dust is electrically conductive due to the CF fibers and the conveying air should not escape unfiltered into the room. Special conveying air filters should be used, which should be replaced once a week or depending on how dirty they are. If glass pipe bends are used in the conveying pipes, these must be earthed.

Shrinkage

The flow behavior as well as the shrinkage are influenced differently by the filler system. For example, a fiber filling not only leads to lower flowability, but also to anisotropic shrinkage, i.e. different shrinkage along and across the flow direction. The shrinkage is also highly dependent on the selected injection molding parameters and the component geometry. The shrinkage values stated in the data sheets have been determined on sample sheets (60 x 40 x 2 mm) under special conditions and can therefore only be regarded as guide values. These values may vary depending on the process, processing conditions and component geometry. For the individual material types, the shrinkage can only be specified within a scattering range due to the large number of different influencing factors.

Downtimes / cleaning

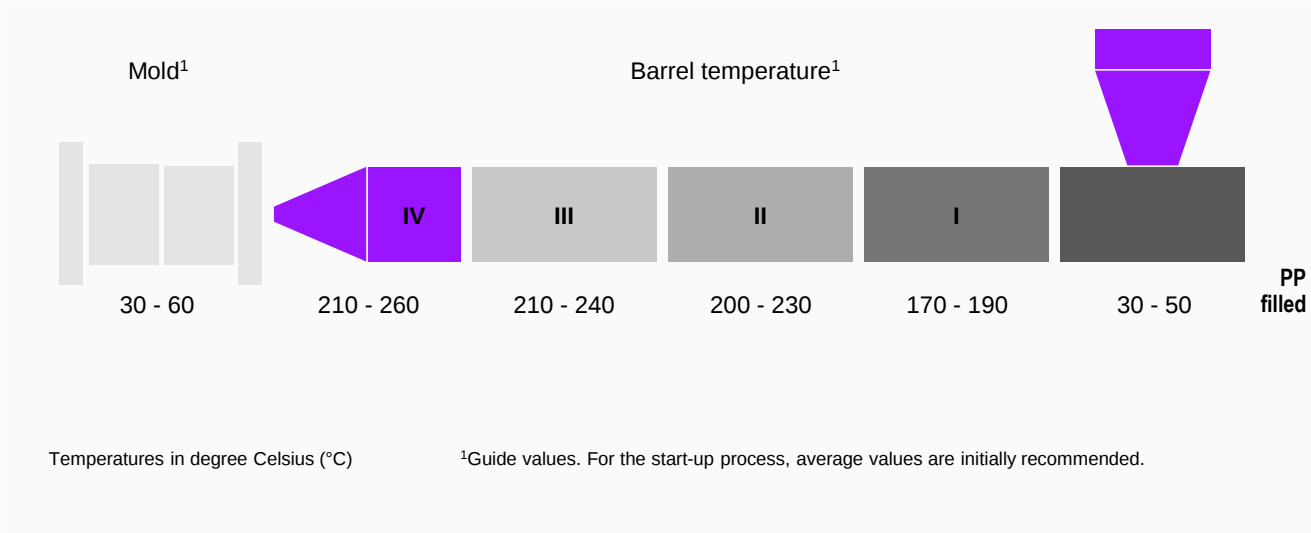
During longer downtimes, the injection molding machine must be cleaned of any molten material inside. The screws and barrels of the injection molding machine should be cleaned when changing materials, colors and production. Special cleaning granulates are available for this purpose, which contain special additives and remove deposits from the components with a viscous, thick melt. In the event of critical material changes, the components should be dismantled and cleaned with hand tools or ovens.

Storage/Shelf life

The original packaging of our goods ensure sufficient protection against dust and other contamination. The quality of plastics during storage depends principally on the storage conditions. Only small variation of the temperature at the storage area are recommend – room temperature is preferred. Avoid high temperature differences between storage and processing area. Store the material in original package for as long as possible and avoid any source of UV-light at the storage area.

Residues

In general, the existence of residual amounts of ferrous and non-ferrous metals cannot be completely ruled out in recycle feedstocks. In order to minimize potential negative effects of such inclusions, MOCOM uses state of-the-art metal (and non-metal) detection and separation systems in the production of its WIC® PP compounds. However the highest product quality assurance processes cannot guarantee zero levels of ferrous and non-ferrous metal in the final product. To further reduce risks, molders are therefor advised to deploy their own detection and separation techniques. In particular, special measures are proposed for hot runner tools.



Properties

Polymer	PP-CF
Density (ISO 1183)	0,95 – 1,11 g/cm ³ (see technical data sheet)

Injection machinera

Screw stroke	Metering stroke between 1 x D and 3 x D (D = Screw diameter)
Screw type	Three zone screw with L/D ratio 18:1 to 22:1
Nozzle type	Open or closed nozzle
Hopper type	Standard

Pre-processing

Storage	Dry, protected from heat and UV radiation	
Dryer type	Air circulation	Dry air (desiccant)
Drying time	2 – 4 h ³	2 -3 h ³
Drying temperature	80°C ³	
Permissible moisture content	< 0,1%	

Processing conditions

Mass temperature	210 – 260°C ³
Mold temperature	30 - 60°C ³
Coolant	Water
Throughput coolant	Turbulent flow must be achieved.
Peripheral screw speed	50 – 100 min ⁻¹
Back pressure (specific)	50 – 150 bar
Residence time	< 8 min
Injection speed	Medium to fast, depending on mold geometry and filler

Shrinkage²

Strongly dependent on the filler and/or additive used, values can be taken from the technical data sheet.

² Shrinkage is not a pure material property, but is influenced by fillers, the part/component geometry, its wall thickness and the position and size of the gate. The processing parameters, such as mold wall and melt temperature, also play a decisive role. ³ General guide values, type-related values can be taken from the data sheet.

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