



MOCOM

❖ Altech® PC Processing Guide Injection Molding

Altech® PC is an amorphous thermoplastic, unfilled or reinforced with glass fiber.

Pre-drying

Altech® PC is a hygroscopic polymer. Due to moisture absorption from the air, drying is mandatory to prevent material degradation during processing and surface defects on the finished parts. Please see the technical data sheet of the individual Altech® PC compound for drying conditions and the residual moisture recommended before processing.

Processing

Altech® PC can be processed on all standard injection molding machines. Wear protected plasticizing units for reinforced Altech® PC compounds are advised. For longer production interruptions, decrease cylinder heaters to about 170 °C and ensure constant heating.

Shrinkage

Shrinkage values are generally to be understood as guide values and do not release the user from the obligation to carry out appropriate tests. They do not represent a pure material property, but are also dependent on the filler, processing method, the shape of the molded part, the uniformity of the wall thickness, the mold design and the processing conditions. As a result of the orientation of the macromolecules, the type, level and direction of the reinforcing materials. The shrinkage depends on multiple factors. Platelet-shaped reinforcing materials, such as those contained in talc-reinforced Altech® PC grades show an increasingly isotropic shrinkage behavior with increasing filler content. Compared with unreinforced grades, the shrinkage is lower, the difference between longitudinal and transverse shrinkage is low, and consequently also the tendency to warp. Fibrous reinforcing materials, such as glass fibers, also lead to a reduction of the shrinkage in the flow direction. However, the difference between longitudinal and transverse shrinkage is considerably greater. For the individual material grades, the shrinkage can therefore only be given in a scattering range.

Adding regrind material

The addition of ground sprues and rejects is generally possible. Exceptions to this are functionalized compounds, which are intended for welding or equipped with flame retardants, for example. The proportion of material returned to the process depends on the process and the final part. It is recommended to determine the ideal point of part quality and usage of the grinded material by means of a series of tests, starting with a low percentage addition.

Coloration

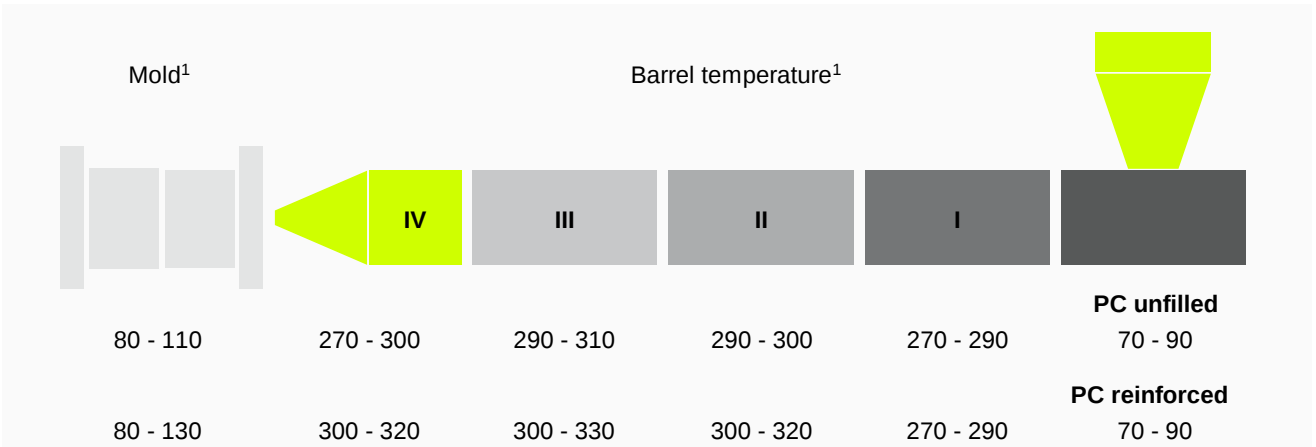
Altech® PC are offered in a variety of different colors and can also be colored according to customer requirements. Please feel free to contact us for this purpose. Subsequent coloration by batch is also possible. Color batches based on polycarbonate are recommended with regard to compatibility and dispersion. Similar melting and flow properties to the selected Altech® PC should be ensured. An improvement in the homogeneity of the color image can be achieved by increasing the back pressure or by installing a mixer on the machine side. The batch manufacturer's instructions must also be observed.

Downtimes / Cleaning

In case of longer downtimes, please clean the injection molding machine from already melted material inside. Screws and barrels of the injection molding machine should be cleaned during material, color and production changes. Special cleaning granules are available for this purpose, which contain special additives and use a tough, low-viscosity melt to remove deposits from the components. When critical material changes occur, the components should be disassembled 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.



Temperatures in degrees Celsius (°C) ¹Guide values. Standard starting profile might be in the middle.

Properties

Polymer	PC
Density (ISO 1183)	1.20 - 1.45 g/cm ³ (see technical data sheet)

Injection machinery

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 needle shut-off nozzle
Hopper type	Standard

Pre-processing

Storage	Dry, protected from heat and UV radiation	
Dryer type	Air circulating	Dry air (desiccant)
Drying time	4 - 12 h	3 - 4 h
Drying temperature	120 °C	120 °C
Permissible moisture content	< 0.02 %	< 0.02 %

Processing conditions

	PC, unfilled	PC, glass fiber reinforced
Mass temperature	280 - 310 °C	310 - 330 °C
Mold temperature	80 - 110 °C	80 - 130 °C
Coolant	Water	
Throughput coolant	Turbulent flow must be achieved	
Peripheral screw speed	50 - 300 mm/s, e.g., screw speed of 40 rpm with a screw diameter of 50 mm	
Back pressure (specific)	50 - 150 bar	
Residence time	4 - 8 min	
Injection speed	Profile for constant flow front speed	

Shrinkage²

	PC, unfilled	PC, glass fiber reinforced
Parallel to flow, 24 h (ISO 294-4)	0,5 – 0,8%	0,2 – 0,5%
Transverse to flow, 24 h (ISO 294-4)	0,5 – 0,8%	0,3 – 0,7%

²Shrinkage 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.

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