



MOCOM

❖ Altech® ECO PET+PBT Processing Guide Injection Molding

Altech® ECO PET+PBT is a semi-crystalline thermoplastic, which can be produced unfilled or reinforced with different kind of fillers like glass fiber, glass beads and or mineral filler.

Pre-drying

Altech® ECO PET+PBT is a hygroscopic polymer. Depending on external conditions, such as climate or storage, the material may absorb moisture. Pre-drying of Altech® ECO PET+PBT compounds is recommend to prevent surface defects or quality issues on the finished parts. Please see the technical datasheet of the individual Altech® ECO PET+PBT compound for drying conditions and the residual moisture recommend before processing. Storage at ambient temperature before use will minimize condensation and humidity absorbance risk.

Processing

Altech® ECO PET+PBT can be processed on all standard injection molding machines. Wear protected plasticizing units for reinforced or filled compounds are advised. High processing and mold temperatures can improve part quality due to improved flowability of the material, among other factors. Higher injection speed for glass fiber reinforced Altech® ECO PET+PBT helps to cover the glass fiber in the parts and to reduce fibers coming to the part surface.

Shrinkage

Shrinkage values are generally only 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, 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 and the type and level of the reinforcing materials, depends on the direction, resulting in different shrinkage behavior. Platelet-shaped reinforcing materials, such as talc-reinforced 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 plastics, shrinkage can therefore only be given in scattering ranges.

Adding regrind material

The addition of 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.

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.

Coloration

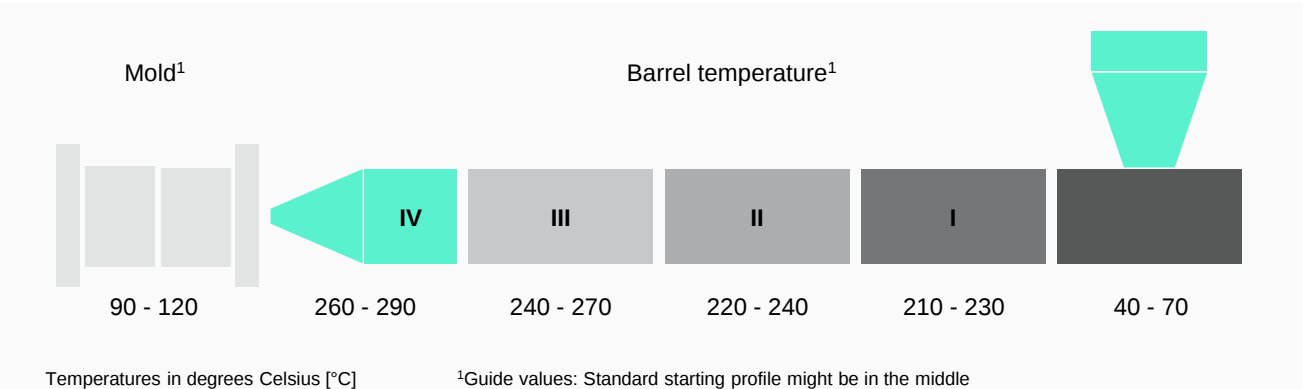
Altech® ECO PET+PBT can be offered in a variety of different colors and can also be colored according to customer requirements. Please feel free to contact us for this purpose. Subsequent coloration by batch is also possible. Color batches based on polyester or universal color batches are recommended with regard to compatibility and dispersion. Similar melting and flow properties to the selected Altech® PET+PBT ECO should be ensured. An improvement in the homogeneity of the color image can be achieved by increasing the back pressure or by installing a mixing element 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.

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 Altech® ECO PET+ECO 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	PET+PBT
Density (ISO 1183)	1,02 - 1,30 g/cm ³ (see technical datasheet)

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 dryer	Dry air dryer
Drying time	4 - 8 h	2 - 4 h
Drying temperature	100 - 120 °C	100 - 120 °C
Permissible moisture content	< 0,04 %	

Processing conditions

Mass temperature	270 - 290 °C (grade related values see technical data sheet)	
Mold temperature	90 - 120 °C	
Coolant	Water	
Throughput coolant	Turbulent flow must be achieved	
Peripheral screw speed	50 - 300 mm/s, e.g., screw speed of 35 rpm with a screw diameter of 50 mm	
Back pressure (specific)	50 - 100 bar	
Residence time	4 - 8 min	
Injection speed	Profile for constant flow front speed	

Shrinkage²

	PET+PBT, glass fiber reinforced
Parallel to flow, 24 h (ISO 294-4)	0,1 - 0,4 %
Transverse to flow, 24 h (ISO 294-4)	0,4 - 0,8 %

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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