

ArcBiox™ materials are biodegradable glass fiber reinforced^{)} or unreinforced composites. These high performance biocomposites provide sustainable green alternatives for demanding technical applications.*

^{*)} The proprietary fiber technology of Arctic biomaterials Oy is based on Long Fiber reinforced Thermoplastic (LFT) technology.

ArcBiox™ BGF30-G

Long glass fiber reinforced impact modified PBS (Polybutylene Succinate) for injection moulding

- ✓ Reinforced with biodegradable glass fiber
- ✓ PBS is made from 50-80% renewable resources and is home compostable
- ✓ Increased end-of-life options
- ✓ Excellent flowability
- ✓ Good flatness & dimensional stability
- ✓ Good temperature resistance
- ✓ Good stiffness & strength

Property	Typical value	Test method
Density	1.6 g/cm ³	ISO 1183 A
Tensile strength at break	97 MPa	ISO 527
Tensile Strain at Break	3 %	ISO 527
Flexural strength	139 MPa	ISO 178
Flexural Modulus	4900 MPa	ISO 178
Izod impact strength	70 kJ/m ²	ISO 180
Izod notched impact strength	34 kJ/m ²	ISO 180
HDT/A 1.8 MPa	109 °C	ISO 75
Vicat softening temperature/ B 50	110 °C	ISO 306

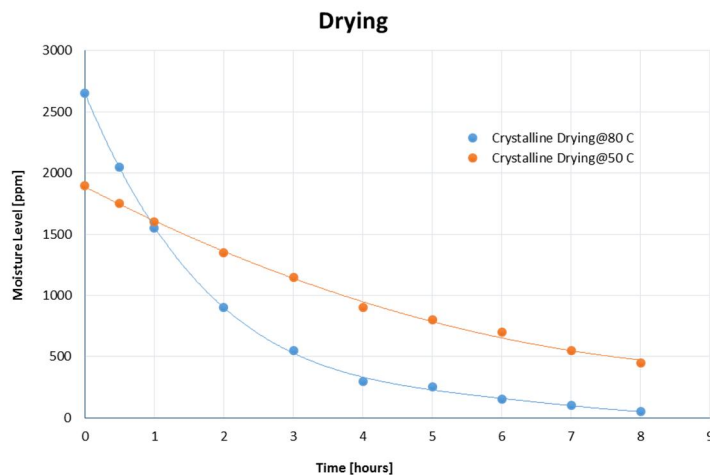
The properties stated above are not for specification purposes.

Parts moulded to 30 °C mould.

Injection moulding of ArcBiox™ PBS-based Materials

Drying

ArcBiox™ materials must be always dried before processing with dehumidifying dryer, due to fact that insufficient drying before processing will cause loss of mechanical properties. Please note that a combination of a very long drying time and high temperature may cause degradation and agglomeration of pellets and may cause yellowing.



Moisture content of less than 0.025% (250 ppm) is recommended to prevent loss of mechanical properties.

Recommended drying time
80 °C 4-5 h

In order to avoid moisture pick-up during processing, the following points should be followed:

- Remaining granules should be stored in air-tight containers
- Residence time inside the hopper should stay below 1 hour
- Dry-air filters should be used in hot-humid climate conditions
- Do not open cold material containers inside normal temperature environment as the granules will act as condensation points (bring containers into production some hours before use)
- Empty machine hopper and store material air-tight in case of production stops

Screw & barrel

When using ArcBiox™ glass fiber reinforced grades wear protected conventional 3-zone screws with L/D-ratio between 18:1 and 22:1 and low compression ratio of 2:1 to 2.5:1 are recommended. Proposed flight depth for metering zone is at minimum 3.5 mm and for feed zone 7.5 mm.

Screws with integrated mixing elements, venting screws with double compression zones or screws with other shear elements are not recommended for the processing of ArcBiox™ glass fiber reinforced grades.

Nozzle

General purpose nozzle tips are recommended. Open nozzles are preferred to nozzles equipped with shut-off devices. The configuration of the bore of the nozzle should closely correspond to the screw tip and the diameter of the nozzle bore must be slightly smaller than the outer sprue bush diameter to allow demolding of the sprue and runner.

Hopper & other connections selection

The hopper should have, preferably, a discharge angle of at least 45°, better 60 °C, flat bottoms and long transition tubes to the feed throat must be avoided. Small feed throat diameters and safety bars, magnets or other inserts can lead to flow stagnations. Allow at least 15 mm free space for the pellets to move. All inside seams must be flush, circular sections are preferred over rectangular flow channels.

Tooling

Due to low shrinkage of material draft angles need to be higher than with unreinforced grades. Following table should be considered in part design on visual surfaces

VDI 3400 ref	12	15	18	21	24	27	30	33	36	39
Ra (µm)	0.4	0.56	0.8	1.12	1.6	2.24	3.14	4.5	6.3	9
Draft angle	1.5	2	2.5	3	3.5	5	4.5	5	5.5	6

Gate should be located in thickest section of the part and recommended size is 0.8 x wall thickness and also round sprues are recommended with diameter of 1.5 x biggest wall thickness. Venting of the tool is very important to avoid burn marks and flashes, where proposed venting depth 0.01 mm and venting channel distance from cavity edge 2-2.5 mm.

Processing Parameters

Melt Temperature	180 – 200 °C
Feed Throat	30 – 50 °C
Feed Temperature	160 – 190 °C
Compression Section	170 – 190 °C
Metering Section	180 – 200 °C
Nozzle	180 – 210 °C
Screw Speed	low to medium to avoid glass fiber breakage
Back Pressure	3 – 5 bars (0.3 – 0.5 MPa)
Change-over point	Change-over point should be always checked visually by setting holding pressure to 0 bar/MPa to avoid over filling and flashes. Part should be 95 – 98% filled before changing to holding pressure.
Holding pressure	60% of max injection pressure
Mold Temperature	20 – 40 °C
Purging / Cleaning of screw	Use low MFR Polypropylene to clean the screw and barrel
Shrinkage	flow 0.25% / xflow 0.5% (tool dimensions 4x70x150 mm)

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