

Product Data Sheet

Marketing Compound SC1

Revision date 18 Apr 2018
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Date previous version 1 Mar 2018
Version & language 2/K004.31 - EN
Product availability Global
Product status Development

PRODUCT DATA SHEET
MARKETING COMPOUND SC1

Interested in solutions for bioplastics? Please contact us at
www.total-corbion.com pla@total-corbion.com

DESCRIPTION

PLA is a biobased polymer derived from natural resources and offers a significant reduction in carbon footprint compared to oil-based plastics. Compound SC1 is a 20% glass reinforced compound, for use in injection molded applications, based on full stereocomplex PLA produced with PLLA and PDLA homopolymers using proprietary Total Corbion PLA technology. Compared to standard and high heat PLA, full stereocomplex PLA compounds have higher melting points and improved mechanical properties, similar to glass reinforced engineering plastics like Nylon 6 and PBT.

TYPICAL PROPERTIES^{1,2}

Parameter	Method	Typical value
Glass fiber contents		20%
Biobased content		78%
Biobased carbon content		98%
Flexural modulus	ISO 178	6000 MPa
Tensile strength	ISO 527	135 MPa
Tensile modulus	ISO 527	8300 MPa
Elongation at break	ISO 527	2%
Charpy notched impact, 23°C	ISO 179	10 kJ/m ²
Charpy unnotched impact, 23°C		44 kJ/m ²
HDT-A (1.80 MPa)	ISO 75-1	195°C
HDT-B (0.45 MPa)	ISO 75-1	211°C
Melting temperature	DSC	220°C

¹ Development grades, available for sampling, all data is preliminary. Total Corbion PLA does not commercially produce these compounds.

² Typical properties, not to be interpreted as specifications

Table 1: Typical properties

PROCESSING INFORMATION & RECOMMENDATIONS

The compounded product should be dried to <400ppm before injection molding. Precautions should be taken to avoid moisture absorption of the dried granulate during processing, for example while sitting in the hopper of the injection molding machine. In general, injection molding conditions should be selected to avoid high stresses and high (back) pressures on the material in order to limit length reduction of the glass fibers.

It is recommended to select an injection molding machine with a low ratio of barrel volume / shot weight to avoid degradation in the barrel. A barrel volume of maximum 5 times the shot weight is recommended.

The achievable cycle time for automatic operation depends on a number of machine, mold and product properties. As the product needs time to crystallize into full stereocomplex PLA, the crystallization time in the mold typically at 120°C is the rate limiting step.

Although automatic operation will also run using lower mold cooling temperatures, this is not recommended because this will result in products with reduced thermal and dimensional stability.



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Parameter	Setting	Remarks
Predrying	Minimum 4hrs at 85°C	Preferred to check moisture content of dried resin with e.g. Karl-Fischer or Brabender aquatrac
Throat temperature	30°C	
Feed zone temperature	180°C	
Compression zone temperature	220°C	
Metering zone temperature	220°C	
Nozzle temperature	230°C	Lower temperature can cause freezing of the nose when using a cold runner
Hot runner temperature	230°C	
Mold temperature	80°C - 140°C	Lower mold temperature can result in failure to form full stereocomplex PLA
Barrel volume	Maximum 5 times the shot volume	
Screw speed	As slow as possible	
<i>Typical settings, may require optimization</i>		

Table 2: Recommended conditions for fully automatic operation

In case of questions please contact your local representative or send an email to pla@total-corbion.com

NOTICE REGARDING USE RESTRICTIONS

Unless specifically agreed to in writing, Total Corbion PLA will not knowingly market any product into any of the following commercial or developmental applications: (1) bottles or preforms, unless specific arrangements on recycling and end-of-life are in place, (2) microbeads used in personal care products, including without limitation, cosmetics or over-the-counter drugs, (3) components of products intended for human or animal consumption or (4) any application that is intended to be used inside the human body.



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