TECHNICAL DATA SHEET
FUTEON™ 201

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DESCRIPTION

Polylactic acid (PLA) is a biobased and biodegradable thermoplastic polymer derived from natural resources. Futeon™ 201 is a PLA homopolymer with high crystallization rate and high flowability designed for thin wall injection molding. Futeon™ 201 can be used directly as neat resin or as part of a compound for the production of semi-crystalline parts with high temperature resistance.

TYPICAL PROPERTIES[1]

PHYSICAL PROPERTIES	METHOD	TYPICAL VALUE
Clarity	/	Cristalline white pellets
Density (g/cm^3)	Literature data	1,24
Moisture content (ppm)	Karl-Fischer	≤ 400
Residual monomer (%)	Futerro method	≤ 0,3
Melt flow index (g/10min)	ISO 1133-A (190°C/2,16 kg)	30
D-isomer content (%)	Futerro method	< 1
Melting temperature (°C)	DSC	175
Glass transition temperature (°C)	DSC	60
PHYSICAL PROPERTIES	**NORM**	**TYPICAL VALUE**
Tensile modulus (MPa)	ISO-527	3500
Tensile strength (MPa)	ISO-527	50
Elongation at break (%)	ISO-527	≤ 5
Charpy, notched (kJ/m²)	ISO-179-1eA	≤ 5
HDT-B, amorphous (°C)	ISO-75	55
HDT-B, crystalline (°C)	ISO-75	105

[1] Typical properties - not to be considered as product specifications

PROCESSING RECOMMENDATIONS

PRE-DRYING	To prevent PLA degradation through hydrolysis during melt processing, we recommend to pre-dry Futeon™ 201 to reach moisture content below 200 ppm (and preferably less than 100 ppm). Typical drying conditions for crystallized pellets are 4-6 hours at 100°C. The resin should not be exposed to atmospheric conditions after drying to prevent moisture uptake. Keep the package sealed until ready to use and promptly reseal any unused material.
EQUIPMENT CONFIGURATION	Futeon™ 201 can be processed on a conventional injection molding equipment and can be used as neat resin or as part of a compound to optimize product properties. The use of a barrel with a content of 3-5 times the shot weight, a general-purpose screw with L/D ratio of at least 20:1 and if applicable low shear hotrunners in the mold are recommended.

START-UP & SHUTDOWN	PLA is not compatible with most of the thermoplastic resins, so purging the line is an important step to reach the full benefits of the mechanical and optical PLA properties. Following steps are recommended: 1. Use a commercial purging compound or high-viscosity stable resin. Adapt the processing conditions according to that resin and start purging. 2. Continue purging until material is clear of black spots and residue. 3. Load PLA polymer and follow recommended operating conditions. 4. Begin production once PLA extrudes cleanly with no contamination. 5. After production, purge with a commercial compound, adjusting conditions as necessary to fully remove PLA.

Note: During PLA processing, not exceed 230°C.

INJECTION MOLDING RECOMMENDATIONS	UNIT	TYPICAL VALUE
Melt temperature	°C	190-210
Feed throat	°C	20-30
Feed temperature	°C	160-180
Compression zone	°C	180-200
Metering zone	°C	190-210
Nozzle	°C	190-210
Mold temperature, amorphous	°C	20-30
Mold temperature, crystalline	°C	90-100
Screw speed	RPM	Low speed
Back pressure	Bar	50-100

Typical settings may require optimization

PACKAGING & STORAGE CONDITIONS

Futeon™ 201 is available in 25 kg aluminum bags and in 850 kg big bags, filled with nitrogen for protection. It is recommended to store PLA granules in its closed original packaging at atmospheric pressure and below 50°C (ideally at ambient temperature). Prolonged storage under extreme temperatures and in direct sunlight should be prevented.

CERTIFICATIONS

Futeon™ 201 is REACH compliant and can be used in Europe.

COMPOSTABILITY

One way to recycle biodegradable materials is through organic recycling, which includes industrial composting and anaerobic digestion. Industrial composting is one recycling method for PLA. Industrial composting process takes place in controlled conditions. The composting period is governed by several factors including temperature (close to 65°C), moisture, amount of oxygen, particle size, the carbon-to-nitrogen ratio, and the degree of turning involved. Generally, effective management of these factors will accelerate the composting process. The outcomes of industrial composting process are CO_2, water, and compost. Compost includes nutrients, and can be used, for example, in agriculture to enhance the soil quality. Futeon™ 201 is certified compostable following DIN EN 13432:2000-12 (max. layer thickness during test: 1030 µm).

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BIOBASED

Futeon™ 201 is made from renewable biobased raw materials. Our products are compliant with ISO 16620-2:2015 and 16785-1 (biobased carbon content: 100%; Volatile solids (organic matter): 100%). By using Futeon™ 201, you can be sure that you are using a biobased product made from renewable raw materials.

FOOD CONTACT STATUS

In the United States of America, Futeon™ 201 has been evaluated and was found to be suitable for food-contact applications. The test was performed by SGS Group in January 2021 and the product was stated compliant with 175.300 Resinous and Polymeric coatings.

In Europe, Futeon™ 201 has been evaluated and was found to be suitable for food-contact applications. The test was performed by SGS Group in January 2021 and Futeon™ 201 was stated compliant with EU commission regulation 10/2011 of 14 January 2011 (and amendment) on plastic materials and articles intended to come in contact with food. There are no SMLs or SML(T)s for the ingredients used to produce Futeon™ PLA; the regulation in place includes a limit of 10 mg/dm^2 on the overall migration from finished plastic articles into food. It is the responsibility of the final product manufacturer to determine that the use of the product is safe and also suitable for the intended application when it comes to food contact product.

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