

Product Data Sheet

Luminy® L040



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Version & language 1 - EN

PRODUCT DATA SHEET

Luminy® L040

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DESCRIPTION

Poly Lactic Acid (PLA) is a biobased polymer derived from natural resources and offers a significant reduction in carbon footprint compared to oil-based plastics. Luminy® L040 is a very high-flow PLA homopolymer specifically developed for meltblown applications. Typical applications include air and liquid filtration media and wipes. Beyond meltblown processing, Luminy® L040 is also well suited for PLA compounds and other applications requiring lower viscosity and enhanced processability.

TYPICAL PROPERTIES¹

Physical properties	Method	Typical value
Density	Literature value	1.24 g/cm ³
Melt flow index	ISO 1133-A (190°C/0.325kg)	10-40 g/10 min
Melt flow index	ISO 1133-A (190°C/2.16kg)	>150 g/10 min
Stereochemical purity	TotalEnergies Corbion method	>99.5% (L-isomer)
Appearance	Visual	Crystalline white pellets
Residual monomer	TotalEnergies Corbion method	≤ 0.50%
Water / moisture	Coulometric Karl-Fischer	≤ 400 ppm
Melting temperature	DSC	175°C
Glass transition temperature	DSC	60°C

¹ Typical properties of Luminy® PLA grades

RHEOLOGY

The rheological profile of Luminy® L040, a very high flow PLA, closely aligns with meltblown PP MFI 450, as illustrated in Figure 1. This ensures a seamless transition and comparable processability during meltblown manufacturing.

Viscosity of Luminy® L040 vs others at 230°C

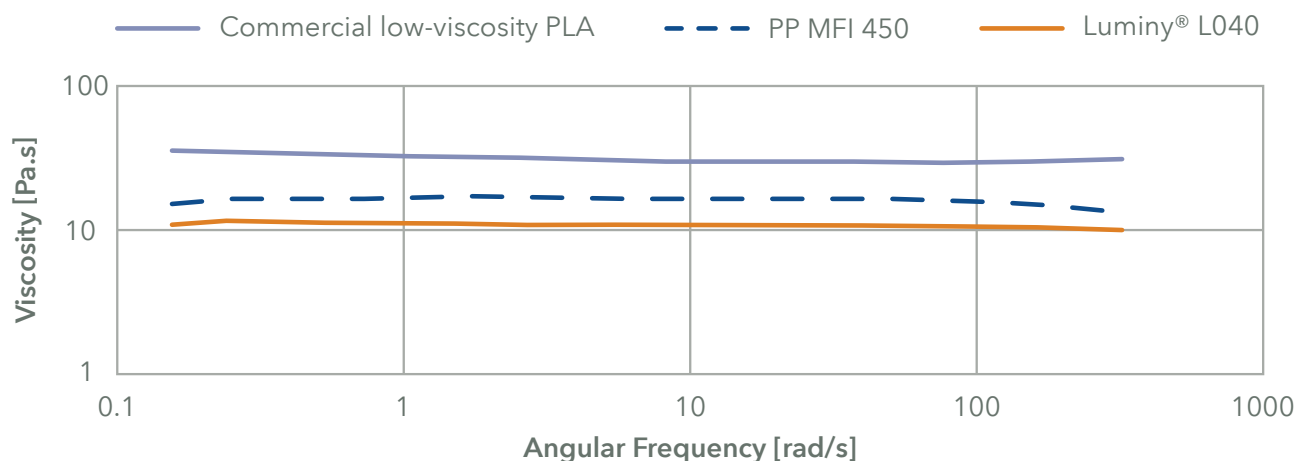


Figure 1: Shear viscosity at 230°C (amplitude of 10%; frequency from 0.5 to 500 rad/s; measured with an Anton Paar MCR302 Rotational Rheometer by TotalEnergies Corbion).

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PROCESSING INFORMATION & RECOMMENDATIONS

Meltblown production

Luminy® L040 is compatible with both single-row and multi-row meltblown equipment. For optimal performance, general purpose screws with L/D ratio of 24:1 – 30:1 are recommended.

Start-up and shutdown

1. Prior to production, ensure the melt spinning equipment is thoroughly cleaned and purged to prevent cross-contamination.
2. At the start of the run it is recommended to purge the system with a high melt PP followed by purging with the PLA homopolymer or PLA compound at its processing conditions.
3. At the completion of the run it is recommended to purge the system by using a PP or purging compound again.

Once the run is complete, all residual PLA must be removed from the system. PLA can degrade over time into lactic acid, which may cause equipment corrosion.

Effective pre-drying is crucial as moisture can lead to hydrolysis of the PLA homopolymer during melt processing, resulting in reduced mechanical performance in the final part. To ensure optimal results, follow recommended drying protocols prior to processing.

MOISTURE AND PRE-DRYING

It is recommended to dry Luminy® L040 from the packaging for 4-6 hours at 100°C. Drying of semi-crystalline Luminy® L040 can be performed in a desiccant hot air dryer, with a dew point of -40°C or less. It is recommended to reduce the moisture content before melt processing to a level less than 250ppm and preferably less than 100 ppm, measured by e.g., Karl-Fischer or Brabender Aquatrac method. Pre-drying is in particular important as moisture causes hydrolysis of the PLA homopolymer during melt processing, resulting in reduced quality of the final part.

PACKAGING & STORAGE CONDITIONS

Luminy® L040 is available in 1250 kg form-stable aluminum-lined big bags and in 25 kg sample bags (moisture level not guaranteed for sample bags). It is recommended to store PLA polymer in its closed, original moisture-barrier packaging at temperatures below 50°C. Storage in direct sunlight should be avoided. The supplied PLA polymer pellets are typically semi-crystalline, unless otherwise stated.

COMPOSTABILITY

Composting of organic waste helps to divert organic waste from landfill or incineration. Composting is a biological process in which organic wastes are degraded by microorganisms into carbon dioxide, water and humus, a soil nutrient. Luminy® PLA polymers are in compliance with the EN-13432 standard. Luminy® L040 has been certified compostable by TUV Austria (OK Compost S478) and by European Bioplastics (Seedling 7W2030) up to a thickness of 2.3 mm. As the compostability of the end product is also dependent on the geometry of product, it is the responsibility of the manufacturer of the end product to ensure compliance with the regulations.

BIOBASED CONTENT

Luminy® L040 has a biobased content of 100% (confidence level 1) and a biobased carbon content of 100% according to EN16785-1 under certificate number DIC-00001. Luminy® L040 is certified 100% biobased according to ASTM D6866 under the USDA Biopreferred program

Meltblown processing recommendations	
Pre-drying	4-6 hours at 100°C
Throat	20-40°C
Feed zone	185-195°C
Compression zone	215-225°C
Metering zone	220-230°C
Melt pump	230-235°C
Spin pack assembly	235 ± 5°C
Throughput	0.08-0.30 g/min.hole
Process air temperature	210-240°C
Process air pressure	0.5-1.2 bar
Secondary air temperature	35-80°C
DCD	100-500 mm
Typical settings, may require optimization	



PRODUCT
DIC-00001

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PLA bioplastics

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FOOD CONTACT STATUS

In the European Union, Luminy® PLA polymers are compliant with EU commission regulation 10/2011 of 14 January 2011 (and amendments) on plastic materials and articles intended to come into contact with food. Lactic acid is considered a dual use substance, since lactic acid is approved as a food additive (additive number E270). There are no SMLs or SML(T)s for the ingredients used to produce Luminy® PLA. The regulation does include a migration limit of 10 mg/dm² on the overall migration from finished plastic articles into food. It is the responsibility of the manufacturer of the final product, when intended as a food contact product, to determine that the use of the product is safe and also suitable for the intended application. While it is TotalEnergies Corbion's conclusion that the above mentioned polymers are permitted, it is the final product which must meet the given regulations and the manufacturer should take responsibility to check if the final product is in compliance with these regulations.

NOTICE REGARDING USE RESTRICTIONS

Unless specifically agreed to in writing, TotalEnergies Corbion 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.