

ME346320 Polylactic acid (PLA) granule

ME346320 (PLA) is a thermoplastic material derived from annually renewable resources and is specifically designed for extrusions applications. It is designed to crystallise during processing, leading to higher heat deflection temperatures in opaque applications

Applications include: Cards, graphic arts & signage

Property	Test method	Value	Units
Density	ASTM D792	1.24	g/cm ³
Melt flow rate (MFR) 210°C, 2.16 kgs	ASTM D1238	8	g/10 min
Intrinsic viscosity	ASTM D5225	4.0	
Amorphous (transparent)			
Tensile strength at yield	ASTM D638	64	MPa
Tensile elongation	ASTM D838	3.6	%
Izod impact strength, Notched	ASTM D256	18.7	J/m
Flexural strength	ASTM D790	113	MPa
Flexural modulus	ASTM D790	3.64	GPa
Heat distortion temperature	ASTM E2092	54	°C
Moulded liner shrinkage		0.3-0.4	%
Semi-crystalline (Opaque)			
Tensile strength at yield	ASTM D638	65.5	MPa
Tensile elongation	ASTM D838	4.3	%
Izod impact strength, Notched	ASTM D256	40	J/m
Flexural strength	ASTM D790	126	MPa
Flexural modulus	ASTM D790	4.36	GPa
Heat distortion temperature	ASTM E2092	144	°C
Moulded liner shrinkage		1.7-1.8	%
Peak crystalline melting point		165-180	°C

Processing Information

This grade is intended for use in semi-crystalline engineering formulation; however, it is sold as a neat resin. The formulator or compounder will need to add nucleating agents, impact modifiers, reinforcing agents to meet customers requirements. It can be processed on most conventional extrusion equipment. The material is stable in the molten state, provided that the drying procedures are followed. More detailed recommendations and processing requirements can be found in the sheet extrusion processing guide, the purging technical data sheet, and the drying and crystallising processing guide. A heated roller or press in the range of 80-130°C can be used to induce crystallisation depending on the formulation characteristics.

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Machine Configuration

PLA will process on conventional extrusion machinery with the following equipment: General purpose screw with L/D ratios from 24:1 to 32:1 and compression ratio of 2.5:1 to 3:1. Smooth barrels are recommended.

Processing temperature profile

Melt temperature	210°C
Feed throat	45°C
Feed temperature	190°C
Compression zone	200°C
Metering zone	210°C
Adapter	210°C
Die	210°C
Screw speed	20-150 rpm

Process Details Startup and Shutdown

As PLA is not compatible with a wide variety of commodity resins, special purging sequences should be followed:

1. Clean extruder and bring temperatures to steady state with low viscosity, general purpose polystyrene or polypropylene.
2. Vacuum out hopper system to avoid contamination.
3. Introduce PLA into the extruder at the operating conditions used in Step 1.
4. Once PLA has purged, reduce barrel temperatures to desired set points.
5. At shutdown, purge machine with high viscosity polystyrene or polypropylene.

Drying

In-line drying may be required. A moisture content of less than 0.025% (250 ppm) is recommended to prevent viscosity degradation. Typical drying conditions for crystallised granules are 2 hours at 90°C or to a dew point of -40°C, airflow rate of greater than 16 kgs/m³ per hour of resin throughput. The resin should not be exposed to atmospheric conditions after drying. Keep the package sealed until ready to use and promptly reseal any unused material. Pellets that have been exposed to the atmosphere for extended time periods will require additional drying time. Amorphous regrind must be crystallised prior to drying, to assure efficient and effective drying. Amorphous polymer must be dried below 50°C.

Properties shown are typical values, they are not absolute material properties, and should be used for guidance only. It is recommended that materials and components are tested for their suitability for a specific application. For more information and advice please discuss your application with our sales staff.



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