

ME346324 Polylactic acid (PLA) granule

ME346324 (PLA) is a thermoplastic material derived from annually renewable resources and is specifically designed for medium flow injection moulding applications. It is designed to crystallise during processing, leading to higher heat deflection temperatures in opaque applications

Applications include: Cutlery, cups, plates, cosmetic packaging, and durables such as electronics housing.

Property	Test method	Value	Units
Density	ASTM D792	1.24	g/cm ³
Melt flow rate (MFR) 210°C, 2.16 kgs	ASTM D1238	24	g/10 min
Intrinsic viscosity	ASTM D5225	3.1	
Amorphous (transparent)			
Tensile strength at yield	ASTM D638	65	MPa
Tensile elongation	ASTM D838	3.4	%
Izod impact strength, Notched	ASTM D256	18.2	J/m
Flexural strength	ASTM D790	112	MPa
Flexural modulus	ASTM D790	3.59	GPa
Heat distortion temperature	ASTM E2092	54	°C
Moulded liner shrinkage		0.2-0.4	%
Mould temperature		26	°C
Semi-crystalline (Opaque)			
Tensile strength at yield	ASTM D638	64	MPa
Tensile elongation	ASTM D838	2.2	%
Izod impact strength, Notched	ASTM D256	32	J/m
Flexural strength	ASTM D790	108	MPa
Flexural modulus	ASTM D790	4.36	GPa
Heat distortion temperature	ASTM E2092	149	°C
Moulded liner shrinkage		1.7-1.8	%
Peak crystalline melting point		165-180	°C
Mould temperature		120	°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 injection moulding equipment.

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The material is stable in the molten state, provided that the drying procedures are followed. Mould flow is highly dependent on melt and mould temperatures. It is recommended to balance screw speed, back pressure, and process temperature to control melt temperature. Injection speed should be medium to fast. Mould temperature is generally elevated in the range of 80-130°C, depending on the formulation characteristics.

Machine Configuration

PLA will process on conventional injection moulding machinery. A general-purpose screw designed to minimise residence time and shear works well. Select the size of machine that will limit the residence time of the molten material in the barrel.

Processing temperature profile

Melt temperature	200°C
Feed throat	20°C
Feed temperature	185°C
Compression zone	195°C
Metering zone	200°C
Nozzle	200°C
Screw speed	200 rpm
Back pressure	17.2 bar

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.

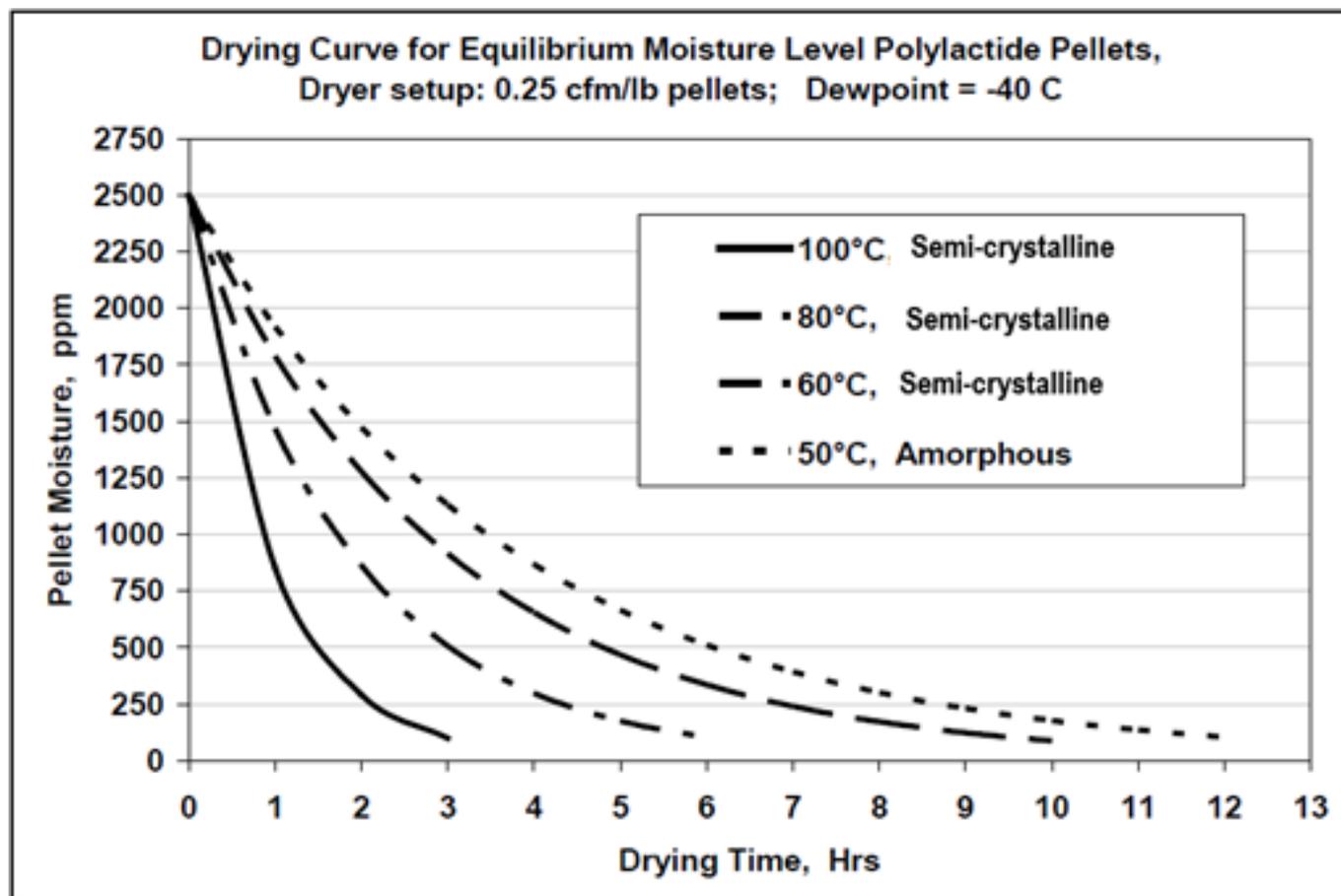
Drying

In-line is recommended 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.



Drying continued:

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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