
Pla Resin Applicable To Extrusion Process

Biomaterials PLA polymer REVODE110 is a thermoplastic resin derived from annually renewable resources and is Applicable to extrusion process.

Resin Properties

	REVODE110	Test Method
Physical Properties		
Density (g/cm3)	1.25±0.05	GB/T1033-1986
Melt Index, g/10min (190°C/2.16kg)	4.0-5.5	GB/T3682-2000
Melting Point (°C)	155-160	GB/T19466.3-2004
Glass Transition Temperature (°C)	56-60	GB/T19466.2-2004
Mechanical Properties		
Tensile Strength (MPa) ≥	50	GB/T1040-1992
Elongation at Break (%) ≥	3.0	GB/T1040-1992
Impact Strength (KJ/m2, Izod)	1-3	GB/T1043-1992

Applications:

Many products can be produced from REVODE110, and the application field of this resin is extended gradually. Suitable products including: 3D printing consumables, consumables, modified, transparent sheet, blister tray, bubble shell, IC card, earthwork and so on.

Process Details

Equipment requirements

REVODE110 is suitable for machining in traditional extrusion type wire drawing machines A sheet thickness between 10-20 mm is recommended. General equipment requirements are: screw with L/D ratio between 28:1 to 32:1 and smooth stuff barrel. Stuff is stable in melt form given it is properly dried.

Cleaning machine

PLA resin REVODE110 is different from other resins, and special purging sequences should be followed:

1. Clean extruder and bring temperatures to steady state with low-viscosity, general-purpose polystyrene or polypropylene.
 1. Contamination of hopper system should be avoid, and the humidity of the air should be kept below -40°C air dew point.
 1. PLA resin can be introduced into extruder after step 1 and 2.

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2. Adjust the temperature of equipment to the operating condition.
 3. When shutting down, the machine should be cleaned with low-viscosity polystyrene or polypropylene.

Note:

1. It is critical that all drying and conveying/receiving systems should be free of all

other contaminant and is vacuumed to ensure that there is no remaining other polymer dust before adding PLA. Since the presence of other polymer contaminant that cannot melt at PLA operating temperature will block screens.

1. When cleaning extruder with polypropylene, the thermally cross-linked one should be avoid.

Drying

REVODE110 has been processed by drying crystallization at our factory. Highest heat stability of the resin is 110 °C and the moisture content is less than 200 ppm. The resin is stored in Aluminum foil bag, protected by box or bag as the outer packaging, and can be used directly. It is more favorable if resin user can re-dry the resin with proper drying equipment and lower the moisture content to 100 ppm or less. It will enhance the processability of the resin and the quality of the consumables

When re-drying the resin, un-dehumidified hot air is forbidden (by using un- dehumidified air, it will speed up water absorption of PLA resin and cause degradation on the resin). Only dehumidified air can guarantee good drying effect of PLA resin in desiccator.

Recommended drying conditions are as follows:

Drying Parameter	Typical Settings
Residence Time (hours)	2-3
Air Temperature (°C)	80
Air Dew Point (°C)	- (40~ 42)
Air Flow Rate (m3/hr-kg resin)	> 1.85

Process temperature

Typical PLA solid line processing parameters:

Extrusion Area	Temperature Setting(°C)
Feed Throat	130-150
Zone 1	175-190

Zone 2	175-190
Zone 3	175-190
Die	170-185

Note: 1. Temperature settings can be optimized during the production process.

1. If the feeding area is blocked, the temperature can be reduced to 110~130 degrees, and the cooling water cycle should be opened.
2. Because there are many kinds of extruder on the market, the actual processing temperature will be different for different screw design. Recovery treatment of renewable materials

RECODE110 renewable materials can be recycled, waste material in the extrusion drawing collection centralized processing, after granulator particles can be used as machine cleaning materials, reduce production costs.

infrared and stirred by rotation mixer after being added into the infrared crystallization rolling barrel. The merit of this method is that the crystallization and drying process can be carried out simultaneously and the process can be finished within 15~20 min.

Crystallization method 3:

After being pre-dried at low-temperature, the renewable materials is then extruded and palletized, after that, the crystallization process can be carried on in PET crystallization equipment.

Note: Bits and pieces can be reused for several times. During the reuse process, a small amount of assistant agent – ADR can be added to reduce property deterioration of the renewable materials effectively, and the recommended amount is 0.1~0.6%.

Product link : <https://www.fancyco.com/?p=20184>