

NONOILEN® 3D 3056-2

TECHNICAL DATASHEET

Last actualisation: 9/2022

Basic description

NONOILEN® is thermoplastic material based on biodegradable polymer blends made of renewable raw materials. NONOILEN®, produced by PANARA a.s., undergoes biodegradation under various natural conditions (e.g. at home compost, industrial compost, soil, seawater) according to material composition.

Application segment

NONOILEN® 3D 3056-2 is optimised for additive manufacturing, mainly for 3D filament production.

Physical form

Cylindrical pellets

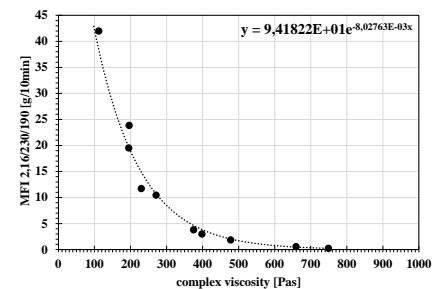
Composition

Major components	PLA, PHB polymers
Minor components	Biodegradable plasticiser(s) and other additives

Material properties (typical values, do not perform a specification of given grade)

Parameter	Test method	Unit	Value	
Rheological properties				
Complex viscosity (measured using oscillating rheometer)	160°C	Internal method	446	
	180°C	Internal method	254	
Shrinkage		%	N/A	
Mechanical properties				
Density at 23°C	ISO 1183	g/cm ³	1,25	
Tensile strength	ISO 527	MPa	40,4	
Tensile strength at break		MPa	34,1	
Elongation at break		%	8,8	
Young modulus		GPa	0,7	
Charpy impact strength un-notched	23°C	ISO 179	kJ/m ²	25,6
Charpy impact strength un-notched	-30°C	ISO 179	kJ/m ²	2,4
Hardness	ISO 868	Shore D	71	

MFI is not relevant parameter for Nonoilen materials because measurement system for MFI does not allow to determine true flow properties of Nonoilen blend. The best testing method is represented by oscillating rheometry which give values of complex viscosity. For better understanding relation between complex viscosity and commonly using MFI parameter, correlation curve between both parameters is in Figure on right side. MFI values represent there MFI of LDPE at 190°C or PP at 230°C under 2.16 kg loading. Viscosity was measured at low shear rates (15/s), so at real high shear rate during injection, Nonoilen will flow much easily.



Parameter	Test method	Unit	Value	
Thermal properties				
Glass transition temperature	DSC	°C	50	
Melting point Tm1	DSC	°C	171	
Melting point Tm2	DSC	°C	N/A	
Crystallisation temperature	DSC	°C	107	
Heat deflection temperature	ISO 75, B	°C	119	
Vicat softening point VST	ISO 306, A/50	°C	150	
Barrier properties				
Permeation of N ₂			N/A	
Permeation of O ₂ (OTR)	23°C, 50%RH, 0,21bar	internal	cm ³ /(m ² .day)	
Permeation of CO ₂			N/A	
Permeation of H ₂ O vapour	23°C, 50%RH	internal	mg(m ² .day)	
Biodegradation				
Degree of disintegration after 90 days incubation	58°C (thermophilic)	ISO 20200	%	*
	25°C (mesophilic)		%	*
Time to 100% disintegration	58°C (thermophilic)		days	*
	25°C (mesophilic)		days	*
Total microbial decomposition	N/A			

* Under certification process

Storage and handling

NONOILEN® is delivered in 20kg barrier bags. The original package should be stored at humidity up to 60% and temperature in range 10 – 30°C. Pellets are pre-dried. Before processing, drying for 1 hour at 70°C is recommended. The moisture content should be below 1000 ppm (0,1%).

Processing conditions

For 3D filament production melt temperature should not exceed 190°C, optimally it should range from 160 to 180°C on the die. Filaments with diameter 1,75 mm or 2,85 mm are usually produced. For 3D printing the base plate temperature is recommended 20-50°C. Filaments on spool are also pre-dried.

Special additives

Colour masterbatches and other additive masterbatches can be used for processing as well as other properties modification. The Clariant masterbatches for NONOILEN® are recommended.

