

# NONOILEN® TF 3350-2

## 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® TF 3350-2 is optimised for sheet extrusion for thermoforming and vacuum forming technology.

### Physical form

Cylindrical pellets

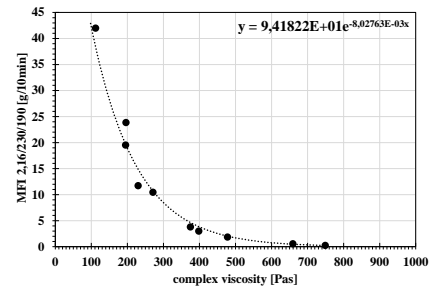
### Composition

<b>Major components</b>	PLA, PHB polymers
<b>Minor components</b>	Biodegradable plasticiser(s) and other additives

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

Parameter	Test method	Unit	Value	
<b>Rheological properties</b>				
Complex viscosity (measured using oscillating rheometer)	160°C	Internal method	Pas	1269
	180°C			Internal method
Shrinkage		%	N/A	
<b>Mechanical properties</b>				
Density at 23°C	ISO 1183	g/cm <sup>3</sup>	1,35	
Tensile strength	ISO 527	MPa	46	
Tensile strength at break		MPa	N/A	
Elongation at break		%	83	
Young modulus		GPa	5,9	
Charpy impact strength un-notched	ISO 179	kJ/m <sup>2</sup>	23°C	17
Charpy impact strength un-notched			-30°C	15
Hardness	ISO 868	Shore D	N/A	
Flexural strength	ISO178	MPa	57	
Flexural deformation		%	40	
Flexural modulus		GPa	4,5	

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
<b>Thermal properties</b>			
Glass transition temperature	DSC	°C	43
Melting point Tm1	DSC	°C	167
Melting point Tm2	DSC	°C	N/A
Crystallisation temperature	DSC	°C	102
Heat deflection temperature	ISO 75, B	°C	105
Vicat softening point VST	ISO 306, A/50	°C	67
<b>Barrier properties</b>			
Permeation of N <sub>2</sub>			N/A
Permeation of O <sub>2</sub> (OTR)	23°C, 50%RH, 0,21bar	internal	cm <sup>3</sup> /(m <sup>2</sup> .day)
Permeation of CO <sub>2</sub>			N/A
Permeation of H <sub>2</sub> O vapour	23°C, 50%RH	internal	mg(m <sup>2</sup> .day)
<b>Biodegradation</b>			
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**

Melt temperature should not exceed 200°C, optimally it should range from 160 to 180°C on the die. Nonoilen TF 3350-2 is suitable for cast film (sheet) extrusion in thickens up to 1 mm – semi-product for thermoforming. Thermoforming process parameters have to be adjusted according to specifics of production line and product shape.

**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.

