NonOilen® TF 3360-1

TECHNICAL DATASHEET

Last actualisation: **7/2023**

Basic description

NonOilen® is thermoplastic material based on biodegradable polymer blends made of 100% 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 3360-1 is optimised for sheet extrusion for thermoforming and vacuum forming technology.

Physical form

Cylindrical pellets

Composition

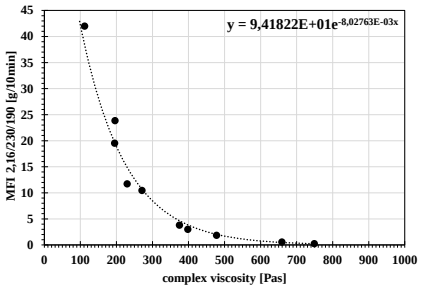
Major components	PLA, PHA polymers
Minor components	Biodegradable plasticiser(s) and other additives

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	Pas	1554
	180°C	Internal method		992
Mechanical properties				
Density at 23°C		ISO 1183	g/cm^3	1,35
Tensile strength	MD	ISO 527	MPa	49
Tensile strength	TD		MPa	42
Elongation at break	MD		%	2
Elongation at break	TD		%	1.7
Tensile modulus	MD		GPa	4
Tensile modulus	TD		GPa	3.9
Charpy impact strength un-notched	23°C	ISO 179	kJ/m^2	16,5
Charpy impact strength un-notched	-30°C		kJ/m^2	13
Flexural strength		ISO178	MPa	67
Flexural deformation			%	52
Flexural modulus			GPa	4

(MD) = Machine direction; (TD) = Transversal direction

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	57
Melting point Tm1		DSC	°C	174
Crystallisation temperature		DSC	°C	101
Heat deflection temperature		ISO 75, B	°C	107
Vicat softening point VST		ISO 306, A/50	°C	83
Barrier properties				
Permeation of O_2 (OTR)	23°C, 0 % RH, 1bar, 150 µm	internal	$cm^3/(m^2.day)$	28
Permeation of H_2O vapour	23°C, 85 % RH, 150 µm	internal	$mg(m^2.day)$	5,55
Biodegradation				
Industrial compost		ISO 14855		OK compost Industrial TÜV Austria*
Home compost				N/A
Biodegradability at soil conditions		ISO 17556		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%).

Special additives

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

Processing conditions

Melt temperature should not exceed 200°C, optimally it should range from 160 to 180°C on the die. NonOilen® TF 3360-1 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.

Zone 1	Zone 2	Zone 3	Zone 4	Die	Chill rolls
180-190 °C	180-190 °C	180-190 °C	180-190 °C	190°C	40-60°C