

NONOILEN® IM 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® IM 3056-2 is optimised for injection moulding technology.

Physical form

Cylindrical pellets

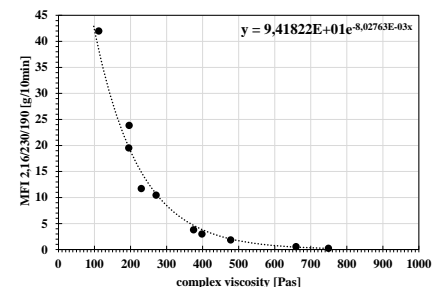
Composition

| | |
|-------------------------|--|
| 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 | 716 | |
| | 180°C | Internal method | 441 | |
| Shrinkage | | % | N/A | |
| Mechanical properties | | | | |
| Density at 23°C | ISO 1183 | g/cm ³ | 1,2 | |
| Tensile strength | ISO 527 | MPa | 38 | |
| Tensile strength at break | | MPa | 26 | |
| Elongation at break | | % | 8 | |
| Young modulus | | GPa | 2,1 | |
| Charpy impact strength un-notched | ISO 179 | 23°C | kJ/m ² | 18 |
| Charpy impact strength un-notched | | | kJ/m ² | 2 |
| 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 | 45 |
| Melting point Tm1 | DSC | °C | 166 |
| Melting point Tm2 | DSC | °C | 172 |
| Crystallisation temperature | DSC | °C | 104 |
| Heat deflection temperature | ISO 75, B | °C | 108 |
| Vicat softening point VST | ISO 306, A/50 | °C | 139 |
| 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

Melt temperature should not exceed 190°C, optimally it should range from 155 to 165°C (barrel) and 175°C on the nozzle. Mould temperature in range between 30 -70°C is recommended according to material composition and product geometry. If homogeneity of the melt is not perfect (unmelted pellets), higher back pressure on the barrel is recommended more than higher temperature.

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.