

Septic tank report revision

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Order ref.	Email 26.9.2024
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Assignment	Report revision for polyethylene material change to Basell 4021.
References	<p>The customer requested to review three test report for septic tanks and evaluate the effect of material change from Total Lumicene mPE M 4041 UV & Borealis Borecene™ RM8342 to Basell 4021.</p> <p>Referenced reports are following:</p> <ol style="list-style-type: none">1. VTT-S-03211-15, Type testing of Uponor 2,4 m³ septic tank concerning structural behaviour, watertightness, nominal capacity and durability. Dated 29.6.20152. VTT-S-08575-08. WehoPuts 5 pienpuhdistamon lujuuslaskelmien tarkastus. Dated 10.10.2008.3. VTT-S-04111-10. Evaluation of WehoMini strength calculations. Dated 18.5.2010.

Evaluation

Density, Melt mass flow rate (MFR) and tensile properties of three materials are presented below in the Table 1.

Table 1. Comparing PE material properties

	MFR, g/10min	Density g/cm ³	Tensile modulus Mpa	Tensile stress at yield Mpa
Basell 4021	4,0	0,9395	750	19
Total Lumicene mPE M 4041 UV	3,6	0,938		21
Borealis BoreceneTM RM8342	6,0		650	18

Results

All materials are according to standard EN 12566-3 requirement:

- MFR (230/2,16) = (5,0 ± 3,0 g)/10 min according to EN ISO 1133
- Density ≥ 0,905 g/cm³ according to EN ISO 1183

Based on the information provided by Customer/Uponor the change of material to Basell 4021 remains essential strength characteristic of septic tanks tested/evaluated in VTT reports VTT-S-03211-15, VTT-S-08575-08 and VTT-S-04111-10.

Espoo, 28.10.2024

Ville Matveinen

Manager, Building Systems

Appendices

1. Basell 4021 datasheet
2. Total Lumicene mPE M 4041 UV material information

Distribution

Customer, electronically approved

The results are only valid for the tested sample(s).

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Technical Data Sheet
Lupolen 4021 K RM

High Density Polyethylene


Product Description

Lupolen 4021 K RM is a new generation hexene linear high density polyethylene for rotomolding. Typical customer applications include large tanks including agricultural and chemical storage containers and underground and infrastructure applications. This product exhibits excellent ESCR and high impact strength at low temperatures. Lupolen 4021 K RM is a UV-stabilized and pelletized polymer. Tests have shown that this material is resisting against the harmful effect of biodiesel fuel*. It is not intended for use in medical and pharmaceutical applications.

* Resistance is based on our latest patented technology

Regulatory Status

For regulatory compliance information, see Lupolen 4021 K RM [Product Stewardship Bulletin \(PSB\) and Safety Data Sheet \(SDS\)](#).

This grade is supported for use in drinking water applications.

Status	Commercial: Active
Availability	Africa-Middle East; Asia-Pacific; Europe
Application	Heating Oil Tanks; Intermediate Bulk Containers; Tanks, Industrial
Market	Industrial Packaging; Industrial, Building & Construction
Processing Method	Rotomolding
Attribute	Good Processability; High ESCR (Environmental Stress Cracking Resistance); Low Temperature Impact Resistance; Low Warpage

Typical Properties	Nominal Value	Units	Test Method
Physical			
Melt Flow Rate, (190 °C/2.16 kg)	4.0	g/10 min	ISO 1133-1
Density	0.9395	g/cm ³	ISO 1183-1
Mechanical			
Tensile Modulus	750	MPa	ISO 527-1, -2
Tensile Stress at Yield	19	MPa	ISO 527-1, -2
Tensile Strain at Break	> 450	%	ISO 527-1, -2
Tensile Strain at Yield	9	%	ISO 527-1, -2
Environmental Stress Crack Resistance, F ₅₀	> 1000	hr	ASTM D1693
Note: Cond. B, 10% Arkopal N100			
FNCT, (6.0 MPa, 2% Arkopal N100, 50 °C)	50	hr	ISO 16770
Impact			
Tensile Impact Strength	120	kJ/m ²	ISO 8256
Note: notched, type 1, method A, -30 °C			
Thermal			
Vicat Softening Temperature, (A/50)	114	°C	ISO 306
Processing Parameters			

LyondellBasell
Technical Data Sheet
Date: 12/12/2023

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Lupolen 4021 K RM
Recipient Tracking #: 4737688
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Quality Certificate

Type 3.1 - Norm EN 10204:2004

Date

29.04.2022

Your purchase order / Date

27-229 1 / 14.04.2022

Our delivery reference / Loading date

87638878 000001 / 29.04.2022

Our order reference

33237689 000001

Customer

80195419

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We certify that the analysis of the characteristics of the batch from which the product dispatched was taken gives the following results :

Material: Our / Your reference

Lumicene M4041UV / 1060238

Batch H204E00196 **Quantity** 26,260 TO

Characteristic	Unit	Value	Test Method
Density	kg/m ³	938,0	ISO 1183
Melt Index 2,16 kg / 190°C	g/10 min	3,60	ISO 1133

The analysis methods are in accordance with the mentioned standards.