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Product Information

VESTAMID® LX9013 BK 9.7507

HIGH-VISCOSITY, PLASTICIZED COMPOUND FOR EXTRUSION WITH AN EXTRAORDINARY LONG-TERM HEAT RESISTANCE

VESTAMID® LX9013 BK 9.7507 is a plasticized polyamide 12 compound with an especially high long-term resistance under thermal load.

The material absorbs only little moisture, thus leading to nearly unaffected dimensions and properties of the finished parts at changing ambient conditions. Extruded tubes are impact-resistant also at low temperatures.

VESTAMID® LX9013 BK 9.7507 is suited to produce flexible tubes that are permanently exposed to higher temperatures, e.g., in the engine compartment of motor vehicles. Especially when used as diesel fuel lines they show significant advantages compared with standard grades, obvious in storage tests with diesel fuel (see the figure).

The material corresponds to the extrusion compound PA12-HIPHL, grade1 acc. DIN 73378 and meets the requirements acc. DIN 74324 (black), ISO 7628 and SAE J844.

VESTAMID® LX9013 BK 9.7507 is supplied as pellets in moisture-proof packaging ready for processing.

Inside the original and undamaged packaging, the product has a shelf life of at least 2 years when stored in dry rooms at temperatures not exceeding 30°C.

Key Features

Industrial Sector
Automotive and Mobility, Sustainable

Sustainability
Sustainable electricity

Processing
Extrusion

Delivery form
Pellets, Granules

Resistance to
Heat (thermal stability), UV / light / weathering, Oil / fuels

Electrical
Insulating

Conformity
Automotive

Additives
Unfilled

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LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® L Compound medium	-	ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	**25.6**	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	**6.0**	kg CO_2 eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	**6.0**	kg CO_2 eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	**0.1**	Annual crop eq. y	ISO 14040, 14044
GWP savings as compared to 2023 reference	**-2.4**	kg CO_2 eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	**410 / 400**	MPa	ISO 527
Tensile strength	**42 / -**	MPa	ISO 527
Stress at 50% strain	**28 / -**	MPa	ISO 527
Stress at break	**42 / 41**	MPa	ISO 527
Nominal strain at break, tB	**200 / 150**	%	ISO 527
Charpy impact strength, +23°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	**130 / 140**	kJ/m²	ISO 179/1eA
Type of failure	**P / P**	-	-
Charpy notched impact strength, -30°C	**7 / 20**	kJ/m²	ISO 179/1eA
Type of failure	**C / C**	-	-
Flexural modulus, 23°C	**400 / 440**	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	**14 / 15**	MPa	ISO 178
Flexural strength, 23°C	**- / 27**	MPa	ISO 178
Flexural strain at flexural strength, 23°C	**4 / 10**	%	ISO 178
Flexural stress at break, 23°C	**N / N**	MPa	ISO 178
Flexural strain at break, 23°C	**N / N**	%	ISO 178

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Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	**172 / ***	°C	ISO 11357-1/-3
Glass transition temperature, DSC	**0 / ***	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**55 / ***	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**130 / ***	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**165 / ***	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**130 / ***	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**160 / ***	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	**160 / ***	E-6/K	ISO 11359-1/-2
Melting Temperature	**172**	°C	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	**1020 / 1020**	kg/m³	ISO 1183
Water absorption	**1.5 / ***	%	Sim. to ISO 62
Humidity absorption	**0.6 / ***	%	Sim. to ISO 62
Shore D hardness	**65[b] / 69[b]**	-	ISO 7619-1
Density	**1020**	kg/m³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	**HB / ***	class	IEC 60695-11-10
Thickness tested	**1.6 / ***	mm	-
Burnin behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**3.2 / ***	mm	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	**1E8 / 5.1E7**	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	**- / 1.5E12**	Ohm per square	IEC 62631-3-2
Relative permittivity, 50Hz	**- / 18.4**	-	IEC 62631-2-1

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Relative permittivity, 100Hz	**12 / 15.6**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**3.4 / 3.6**	-	IEC 62631-2-1
Dissipation factor, 50Hz	**- / 8870**	E-4	IEC 62631-2-1
Dissipation factor, 100Hz	**5000 / 6650**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**1000 / 1390**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	**25 / 23**	kV/mm	IEC 60243-1
Dielectric strength, AC, S20/P50	**22 / -**	kV/mm	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	**600 / -**	-	IEC 60112
Assessment of the insulation group	**I**	-	DIN EN 60664-1

Rheological properties	**dry / cond**	**Unit**	**Test Standard**
Melt volume-flow rate, MVR	**N / A / ***	cm^3/10min	ISO 1133
Molding shrinkage, parallel	**0.4 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**1.5 / ***	%	ISO 294-4, 2577

Pipes Properties	**dry / cond**	**Unit**	**Test Standard**
Impact strength with pendulum, pipe, -40°C	**N / ***	J	DIN 73378
Tube dimension, OD x WT	**8 x 1 / ***	mm	DIN 73378
Cold impact resistance, breaks of 10, -40°C, 912g	**0 / ***	-	SAE J2260, J2043
Tube dimension, OD x WT	**8 x 1 / ***	mm	SAE J2260, J2043
Cold impact resistance, breaks of 10, -40°C, 454g	**0 / ***	-	SAE J844
Tube dimension, OD x WT	**8 x 1 / ***	mm	SAE J844
Cold impact resistance, breaks of 10, -40°C, 454g	**0 / ***	-	SAE J844
Tube dimension, OD x WT	**8 x 1**	mm	SAE J844
Pretreatment	**2h boiling water**	-	SAE J844
Cold impact resistance, breaks of 10, -40°C, 454g	**0 / ***	-	SAE J844
Tube dimension, OD x WT	**8 x 1**	mm	SAE J844
Pretreatment	**24h 110°C**	-	SAE J844

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Burst hoop stress, 23°C, H2O	**24.8 / ***	MPa	DIN 53758, historical

Test specimen production	**dry**	**Unit**	**Test Standard**
Injection Molding, melt temperature	**220**	°C	ISO 294
Injection Molding, mold temperature	**60**	°C	ISO 294
Injection Molding, injection velocity	**200**	mm/s	ISO 294
Injection Molding, pressure at hold	**70**	MPa	ISO 294

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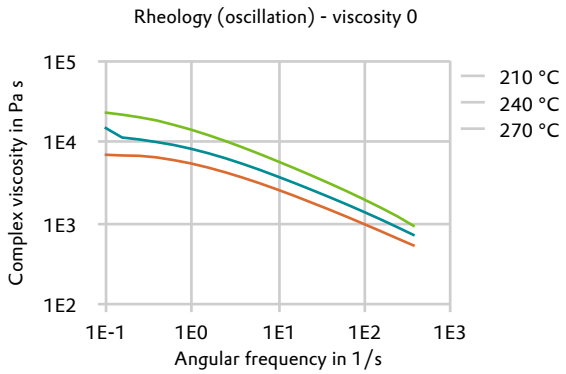
Diagrams

Rheology (oscillation) - viscosity 0



Strain: 3 %

Characteristics

Applications
Tube and hose

Color
Black

Processing
Profile extrusion, Pipe/Tube extrusion

Additives
Plasticizer, Impact restistant, Heat stabilizer

Special Characteristics
High impact strength, High heat resistant, High viscosity

Chemical Resistance
Fuel resistance

Chemical Media Resistance

Acids

- ✔ Acetic Acid (5% by mass) (23°C)
- ✔ Citric Acid solution (10% by mass) (23°C)

Bases

- ✔ Sodium Hydroxide solution (35% by mass) (23°C)
- ✔ Sodium Hydroxide solution (1% by mass) (23°C)

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- ✔ Ammonium Hydroxide solution (10% by mass) (23°C)

Alcohols

- ✔ Isopropyl alcohol (23°C)
- ✔ Methanol (23°C)
- ✔ Ethanol (23°C)

Hydrocarbons

- ✔ n-Hexane (23°C)
- ✔ Toluene (23°C)
- ✔ iso-Octane (23°C)

Ketones

- ✔ Acetone (23°C)

Ethers

- ✔ Diethyl ether (23°C)

Mineral oils

- ✔ SAE 10W40 multigrade motor oil (23°C)
- ✔ Insulating Oil (23°C)

Standard Fuels

- ✔ ISO 1817 Liquid 1 (60°C)
- ✔ ISO 1817 Liquid 2 (60°C)
- ✔ ISO 1817 Liquid 3 (60°C)
- ✔ ISO 1817 Liquid 4 (60°C)
- ✔ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)
- ✔ Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23°C)
- ✔ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- ✔ Diesel fuel (pref. ISO 1817 Liquid F) (90°C)
- ✔ Diesel EN 590 (100°C)

Salt solutions

- ✔ Sodium Chloride solution (10% by mass) (23°C)
- ✔ Sodium Carbonate solution (20% by mass) (23°C)
- ✔ Sodium Carbonate solution (2% by mass) (23°C)
- ✔ Zinc Chloride solution (50% by mass) (23°C)

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Other

- ✔ Ethyl Acetate (23°C)
- ✔ Hydrogen peroxide (23°C)
- ✔ DOT No. 4 Brake fluid (120°C)
- ✔ Water (23°C)