Product Information

VESTAMID® X7293 NC

HIGH VISCOSITY, PLASTICIZED, IMPACT MODIFIED, HEAT- AND LIGHT-STABILIZED POLYAMIDE 12 COMPOUND

VESTAMID® X7293 NC is a plasticized polyamide 12 compound with heat and light stabilizer for the extrusion of flexible tubing and hose, especially for automotive applications according to DIN 73378, (PA 12-HIPHL, Type 1), ISO/DIN 7628-1 (PA 12-HIPEHL, Type 1) and SAE J844.

VESTAMID® X7293 NC is distinguished by an easy processing as well as by a high impact strength at low temperatures.

Properties of compounds based on PA 12 vary little with changing humidity due to low moisture absorption. Parts made of this semi-crystalline material are characterized by exceptional impact strength, low coefficient of friction and good chemical resistance.

VESTAMID® X7293 NC is supplied as cylindrical granules, ready for processing, in moisture-proof bags.

The use of colorants may affect property values.

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.

The results shown have been generated from a low number of production lots. Therefore, they are preliminary and not yet the result of a statistical evaluation. Therefore they must not be used to establish specifications.

Key Features

Industrial Sector
Automotive and Mobility, Sustainable, Industry and Engineering

Sustainability
Sustainable electricity

Processing
Injection molding, Extrusion

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

Electrical
Insulating

Conformity
Automotive

VESTAMID®

Delivery form
Pellets, Granules

Additives
Lubricant, Unfilled

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	**390 / -**	MPa	ISO 527
Tensile strength	**25 / -**	MPa	ISO 527
Yield stress	**25 / -**	MPa	ISO 527
Yield strain	**36 / -**	%	ISO 527
Stress at 50% strain	**26 / -**	MPa	ISO 527
Stress at break	**41 / -**	MPa	ISO 527
Nominal strain at break, tB	**235 / -**	%	ISO 527
Charpy impact strength, +23°C	**N / -**	kJ/m²	ISO 179/1eU
Charpy impact strength, 0°C	**N / -**	kJ/m²	ISO 179/1eU
Charpy impact strength, -20°C	**N / -**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**N / -**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	**130 / -**	kJ/m²	ISO 179/1eA
Type of failure	**P / -**	-	-
Charpy notched impact strength, -30°C	**7 / -**	kJ/m²	ISO 179/1eA
Type of failure	**C / -**	-	-

Flexural modulus, 23°C	**400 / -**	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	**14 / -**	MPa	ISO 178
Flexural strength, 23°C	**22 / -**	MPa	ISO 178
Flexural strain at flexural strength, 23°C	**9 / -**	%	ISO 178
Flexural stress at break, 23°C	**N / -**	MPa	ISO 178
Flexural strain at break, 23°C	**N / -**	%	ISO 178

Thermal properties	**dry / cond**	**Unit**	**Test Standard**
Melting temperature	**172 / ***	°C	ISO 11357-1/-3
Glass transition temperature, DSC	**8 / ***	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**45 / ***	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**100 / ***	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**167 / ***	°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	**180 / ***	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	**180 / ***	E-6/K	ISO 11359-1/-2
Melting Temperature	**172**	°C	ASTM D 3418

Physical properties	**dry / cond**	**Unit**	**Test Standard**
Density	**1020 / -**	kg/m³	ISO 1183
Humidity absorption	**0.7 / ***	%	Sim. to ISO 62
Density	**1020**	kg/m³	ASTM D 792

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	**1E10 / -**	Ohm*m	IEC 62631-3-1
Relative permittivity, 100Hz	**11 / -**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**4.6 / -**	-	IEC 62631-2-1
Dissipation factor, 100Hz	**2000 / -**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**1900 / -**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/P50	**30 / -**	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	**26 / ***	cm^3/10min	ISO 1133
Temperature	**220 / ***	°C	-
Load	**10 / ***	kg	-
Molding shrinkage, parallel	**0.7 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**1.4 / ***	%	ISO 294-4, 2577
Mold temperature	**60 / ***	°C	-
Melt temperature	**240 / ***	°C	-

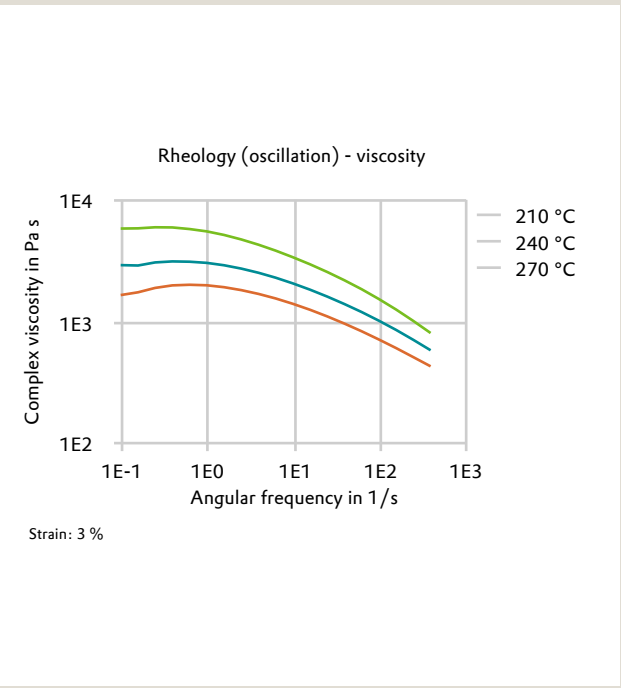
Pipes Properties	dry / cond	Unit	Test Standard
Cold impact resistance, breaks of 10, -40°C, 454g	**0 / ***	-	SAE J844
Tube dimension, OD x WT	**6 x 1**	mm	SAE J844
Pretreatment	**2h boiling water**	-	SAE J844
Cold impact resistance, breaks of 10, -40°C, 454g	**0 / ***	-	SAE J844
Tube dimension, OD x WT	**6 x 1**	mm	SAE J844
Pretreatment	**24h 110°C**	-	SAE J844
Burst hoop stress, 23°C, H2O	**24.5 / ***	MPa	DIN 53758, historical
Burst hoop stress, 100°C, in Oil	**10.5 / ***	MPa	DIN 53758, historical

Properties of 3D printed parts acc. ISO	dry / cond	Unit	Test Standard
Charpy impact strength flat X, -20°C	**N / -**	kJ/m²	ISO 179/1eU

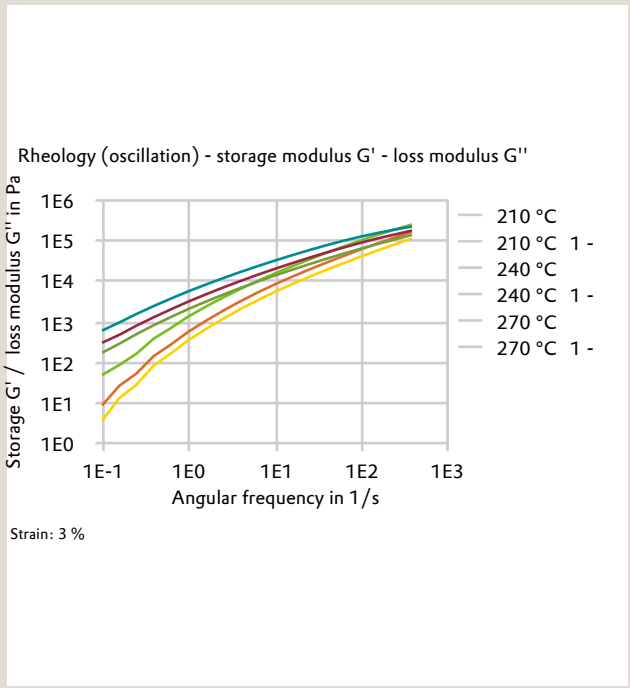
Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	**220**	°C	ISO 294
Injection Molding, mold temperature	**60**	°C	ISO 294
Injection Molding, injection velocity	**200**	mm/s	ISO 294
Injection Molding, pressure at hold	**70**	MPa	ISO 294

Diagrams

Rheology (oscillation) - viscosity



Rheology (oscillation) - storage modulus G' - loss modulus G''



Characteristics

Applications
Tube and hose

Color
Natural color

Processing
Profile extrusion, Pipe/Tube extrusion

Additives
Plasticizer, Impact restistant, Light stabilizer, Heat stabilizer

Special Characteristics
High impact strength, Light-stabilized, High heat resistant

Chemical Resistance
General chemical resistance

Features
Low coefficient of friction

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)
- ✔ 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)

Other

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

Rheological calculation properties	dry	Unit	Test Standard
Min. mold temperature	**30**	°C	-
Max. mold temperature	**100**	°C	-
Min. melt temperature	**200**	°C	-
Max. melt temperature	**240**	°C	-