VESTAMID®

Product Information

VESTAMID® X7166

LOW VISCOSITY, SELF-EXTINGUISHING POLYAMIDE 12 COMPOUND, FREE OF HALOGEN AND PHOSPHORUS

VESTAMID® X7166 NC is a heat stabilized PA 12 compound containing a non-migrating flame retardant, free of halogen and phosphorus. Tested according to UL94, VESTAMID® X7166 complies with the flammability class V-2.

Due to the halogen- and phosphorus-free flame retardants, VESTAMID® X7166 is especially suitable for the electronic and cable industry. It can be used for injection molding as well as for wire extrusion coating.

VESTAMID® X7166 is supplied as cylindrical granules, ready for processing, in moisture-proof bags.

Due to the flame retardants, the melt temperature should not exceed 260°C. We recommend melt temperatures within a range of 210°C to 230°C.

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.

Key Features

Industrial Sector
Sustainable, Aircraft and Aerospace, Industry and Engineering

Delivery form
Pellets, Granules

Sustainability
Sustainable electricity

Resistance to
Heat (thermal stability), Fire / burn

Processing
Injection molding, Extrusion

Additives
Flame retardant

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	**1890 / -**	MPa	ISO 527
Tensile strength	**47 / -**	MPa	ISO 527
Yield stress	**47 / -**	MPa	ISO 527
Yield strain	**5.8 / -**	%	ISO 527
Stress at break	**32 / -**	MPa	ISO 527
Nominal strain at break, tB	**20 / -**	%	ISO 527
Charpy impact strength, +23°C	**57 / -**	kJ/m²	ISO 179/1eU
Type of failure	**C / -**	-	-
Charpy impact strength, -30°C	**80 / -**	kJ/m²	ISO 179/1eU
Type of failure	**C / -**	-	-
Charpy notched impact strength, +23°C	**3 / -**	kJ/m²	ISO 179/1eA
Type of failure	**C / -**	-	-
Charpy notched impact strength, -30°C	**5 / -**	kJ/m²	ISO 179/1eA
Type of failure	**C / -**	-	-
Flexural modulus, 23°C	**1770 / -**	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	**55 / -**	MPa	ISO 178
Flexural strength, 23°C	**66 / -**	MPa	ISO 178
Flexural strain at flexural strength, 23°C	**7 / -**	%	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	**178 / ***	°C	ISO 11357-1/-3
Glass transition temperature, DSC	**41 / ***	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**50 / ***	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**140 / ***	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**175 / ***	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**150 / ***	°C	ISO 306
Melting Temperature	**178**	°C	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	**1070 / -**	kg/m³	ISO 1183
Water absorption	**1.3 / ***	%	Sim. to ISO 62
Humidity absorption	**0.6 / ***	%	Sim. to ISO 62
Density	**1070**	kg/m³	ASTM D 792

Burning Behav.	dry / cond	Unit	Test Standard
UL Yellow Card available	yes / *	-	-
Burning behav. at 1.5 mm nom. thickn.	**V-2 / ***	class	IEC 60695-11-10
Thickness tested	**1.6 / ***	mm	-
Burnin behav. at thickness h	**V-2 / ***	class	IEC 60695-11-10
Thickness tested	**3.2 / ***	mm	-
Burning behav. at thickness h	**V-2 / ***	class	IEC 60695-11-10
Thickness tested	**0.8 / ***	mm	-
Oxygen index	**34 / ***	%	ISO 4589-1/-2
Limiting Oxygen Index	**34**	%	ASTM D 2863

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	**1E12 / -**	Ohm*m	IEC 62631-3-1
Relative permittivity, 1MHz	**3.6 / -**	-	IEC 62631-2-1

Dissipation factor, 1MHz	**340 / -**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	**28 / -**	kV/mm	IEC 60243-1
CTI, test solution A, 50 drops value	**600 / -**	-	IEC 60112
Assessment of the insulation group	**I**	-	DIN EN 60664-1

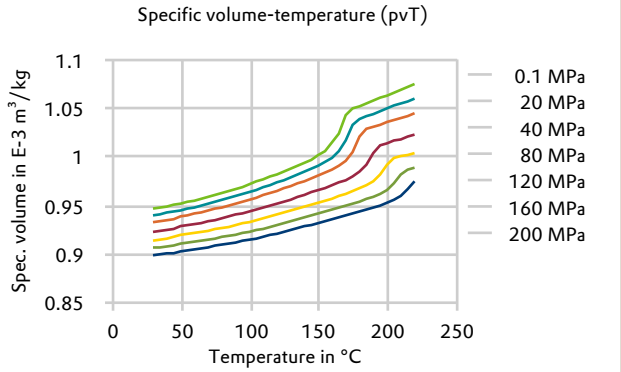
Rheological properties	**dry / cond**	**Unit**	**Test Standard**
Melt volume-flow rate, MVR	**108 / ***	cm^3/10min	ISO 1133
Temperature	**250 / ***	°C	-
Load	**2.16 / ***	kg	-
Molding shrinkage, parallel	**0.7 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**0.8 / ***	%	ISO 294-4, 2577
Mold temperature	**80 / ***	°C	-
Melt temperature	**220 / ***	°C	-

Polymer analytics	**dry / cond**	**Unit**	**Test Standard**
Viscosity number	**120 / ***	cm^3/g	ISO 307, 1157, 1628

Test specimen production	**dry**	**Unit**	**Test Standard**
Injection Molding, melt temperature	**220**	°C	ISO 294
Injection Molding, mold temperature	**80**	°C	ISO 294
Injection Molding, injection velocity	**200**	mm/s	ISO 294
Injection Molding, pressure at hold	**70**	MPa	ISO 294

Diagrams

Specific volume-temperature (pvT)



Characteristics

Applications
Electrical and Electronical, IT and telecommunication, Cable sheathing

Processing
Profile extrusion

Special Characteristics
Halogen-free, Phosphorus-free, Semi-crystalline, High heat resistant, Low viscosity

Features
Low coefficient of friction

Color
Natural color

Additives
Flame retardant, Heat stabilizer, Processing aids

Chemical Resistance
General chemical 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)
- ✔ 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)

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)

Other

- ✔ Ethyl Acetate (23°C)
- ✔ Hydrogen peroxide (23°C)
- ✔ Water (23°C)

Rheological calculation properties	dry	Unit	Test Standard
Density of melt	**860**	kg/m³	-
Thermal conductivity of melt	**0.2**	W/(m K)	-
Spec. heat capacity of melt	**3000**	J/(kg K)	-
Min. mold temperature	**30**	°C	-
Max. mold temperature	**100**	°C	-

Min. melt temperature	**200**	°C	-
Max. melt temperature	**240**	°C	-