VESTAMID®

Product Information

VESTAMID® L2140 NC

HIGH VISCOSITY, HEAT AND LIGHT STABILIZED PA12 COMPOUND

VESTAMID® L2140 NC is a heat and light stabilized polyamide 12 compound for the extrusion of tubings (e.g. fuel lines) and semi-finished products. Tubing according to DIN 73 378, Type: PA 12-HL.

Properties of compounds based on PA12 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.

Pigmentation may affect 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
Automotive and Mobility, Sustainable, Industry and Engineering

Sustainability
Sustainable electricity

Processing
Injection molding, Extrusion

Delivery form
Pellets, Granules

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

Electrical
Insulating

Conformity
Automotive

Additives
Lubricant, Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® L Compound low	-	ISO 14040, 14044

LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	**25.7**	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	**6.1**	kg CO_2 eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	**6.1**	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	**-2.5**	kg CO_2 eq./kg	ISO 14040, 14044

Mechanical properties ISO	**dry / cond**	**Unit**	**Test Standard**
Tensile modulus	**218000 / 174000**	psi	ISO 527
Tensile strength	**6380 / 5510**	psi	ISO 527
Yield stress	**6380 / 5510**	psi	ISO 527
Yield strain	**4 / 11**	%	ISO 527
Stress at 50% strain	**5510 / ***	psi	ISO 527
Stress at break	**6380 / ***	psi	ISO 527
Nominal strain at break, tB	**140 / >50**	%	ISO 527
Charpy impact strength, +23°C	**N / N**	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30°C	**N / N**	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, +23°C	**16.6 / 26.2**	ftlb/in²	ISO 179/1eA
Type of failure	**C / C**	-	-
Charpy notched impact strength, -30°C	**4.28 / 4.76**	ftlb/in²	ISO 179/1eA
Type of failure	**C / C**	-	-
Flexural modulus, 23°C	**212000 / 145000**	psi	ISO 178
Flexural stress at conv. deflection, 23°C	**7400 / 4930**	psi	ISO 178
Flexural strength, 23°C	**8560 / 6240**	psi	ISO 178
Flexural strain at flexural strength, 23°C	**6 / 8**	%	ISO 178
Flexural strain at break, 23°C	**N / N**	%	ISO 178

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	**352 / ***	°F	ISO 11357-1/-3
Glass transition temperature, DSC	**113 / ***	°F	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**122 / ***	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**230 / ***	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**338 / ***	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**284 / ***	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**7.78E-5 / ***	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	**7.78E-5 / ***	in/in/°F	ISO 11359-1/-2
Melting Temperature	**352**	°F	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	**1.01 / 1.01**	g/cm³	ISO 1183
Water absorption	**1.6 / ***	%	Sim. to ISO 62
Humidity absorption	**0.8 / ***	%	Sim. to ISO 62
Shore D hardness	**75**[b] **/ -**	-	ISO 7619-1
Density	**1.01**	g/cm³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
UL Yellow Card available	yes **/ ***	-	-
Burning behav. at 1.5 mm nom. thickn.	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.0591 / ***	in	-
Burnin behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.1181 / ***	in	-
Burning behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.0319 / ***	in	-
Hot Wire Ignition (HWI)	**4**	PLC	IEC 60695-2-20

HWI - thickness tested	**0.0319**	in	-
Hot Wire Ignition (HWI)	**3**	PLC	IEC 60695-2-20
HWI - thickness tested	**0.0591**	in	-
Hot Wire Ignition (HWI)	**2**	PLC	IEC 60695-2-20
HWI - thickness tested	**0.1181**	in	-

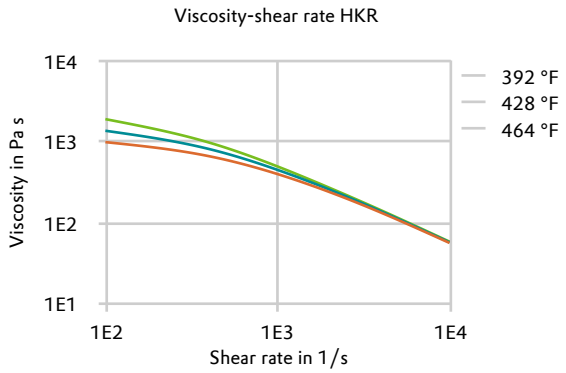
Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	**1E13 / 3E12**	Ohm*m	IEC 62631-3-1
Surface resistivity, E	*** / 1E15**	Ohm	IEC 62631-3-2
Surface resistivity, C, circular electrodes	**>1E15 / >1E15**	Ohm/sq	IEC 62631-3-2
Relative permittivity, 100Hz	**3.7 / 5**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**3 / 3.4**	-	IEC 62631-2-1
Dissipation factor, 100Hz	**450 / 800**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**260 / 500**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	**- / 711**	kV/in	IEC 60243-1
Dielectric strength, AC, S20/P50	**660 / -**	V/mil	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	**600 / 600**	-	IEC 60112
Assessment of the insulation group	**I**	-	DIN EN 60664-1
CTI, Performance Level Categories, PLC	**0**	class	ASTM D 3638

Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	**3 / ***	cm^3/10min	ISO 1133
Temperature	**220 / ***	°C	-
Load	**5 / ***	kg	-
Molding shrinkage, parallel	**0.7 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**1.2 / ***	%	ISO 294-4, 2577
Mold temperature	**176 / ***	°F	-
Melt temperature	**464 / ***	°F	-

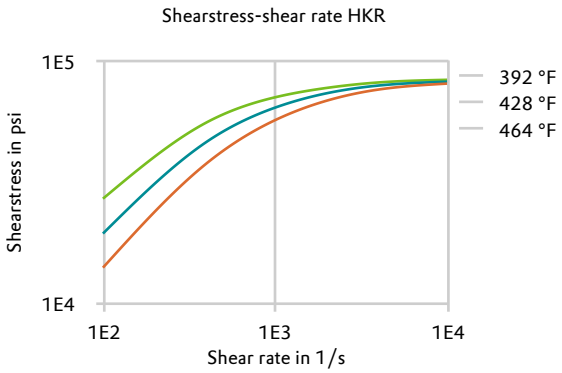
Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	**464**	°F	ISO 294
Injection Molding, mold temperature	**140**	°F	ISO 294
Injection Molding, injection velocity	**7.87**	in/s	ISO 294
Injection Molding, pressure at hold	**10200**	psi	ISO 294

Diagrams

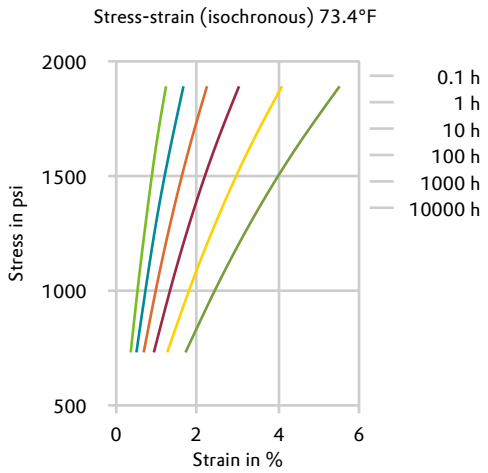
Viscosity-shear rate HKR



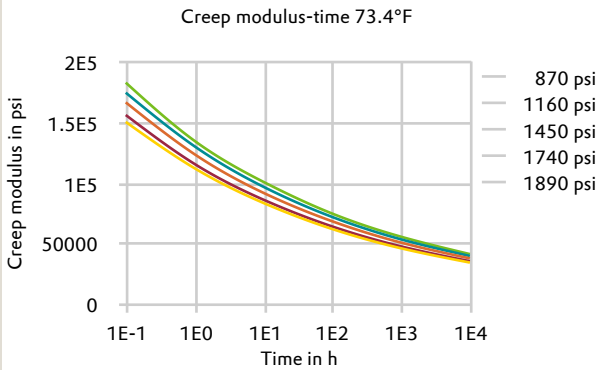
Shearstress-shear rate HKR



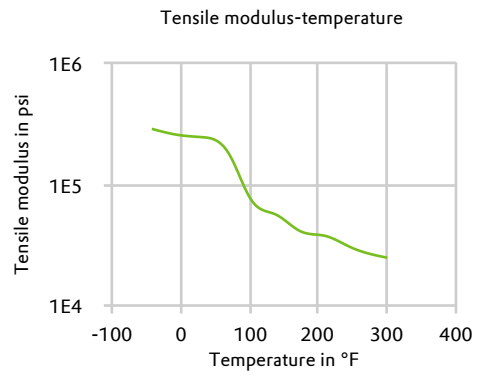
Stress-strain (isochronous) 73°F



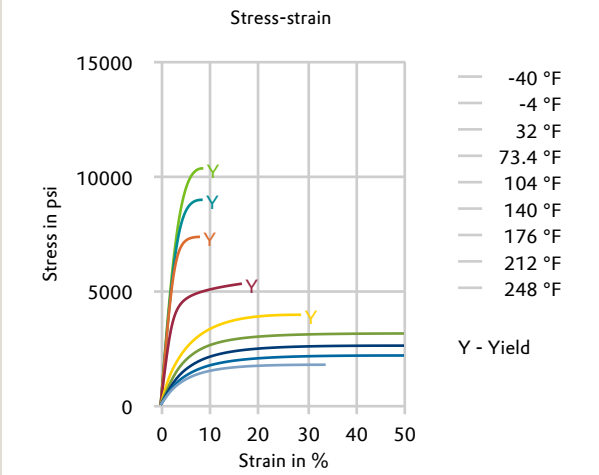
Creep modulus-time 73°F



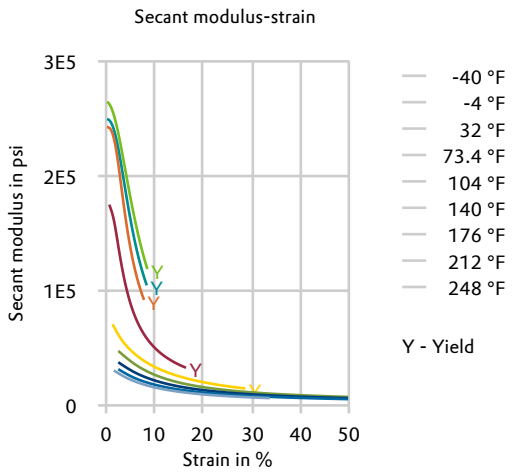
Tensile modulus-temperature



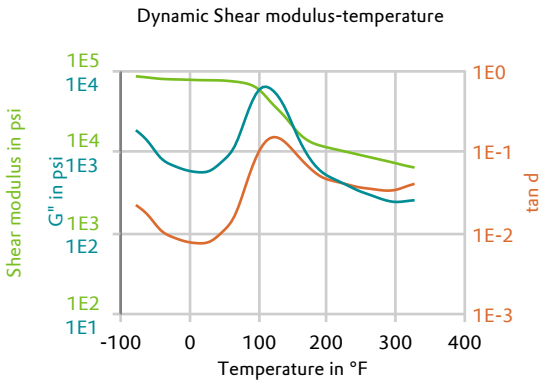
Stress-strain



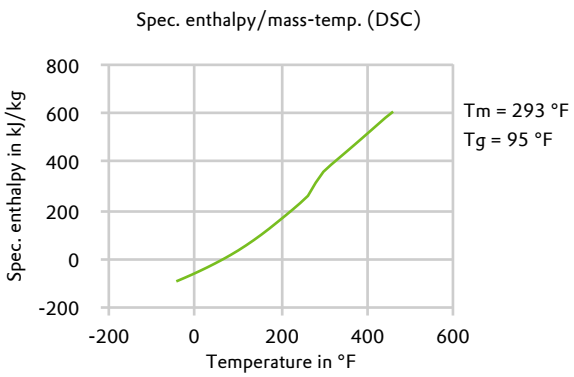
Secant modulus-strain



Dynamic Shear modulus-temperature



Spec. enthalpy/mass-temp. (DSC)



VESTAMID®

Characteristics

Applications
Electrical and Electronical

Color
Natural color

Processing
Profile extrusion

Additives
Light stabilizer, Heat stabilizer

Special Characteristics
Semi-crystalline, Light-stabilized, High heat resistant, High viscosity

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
Density of melt	**53.7**	lb/ft^3	-
Thermal conductivity of melt	**1.39**	BTU in/(hr ft^2 °F)	-
Spec. heat capacity of melt	**1.13**	BTU/(lb·F)	-
Min. mold temperature	**86**	°F	-
Max. mold temperature	**212**	°F	-
Min. melt temperature	**428**	°F	-
Max. melt temperature	**500**	°F	-