Product Information

VESTAMID® L-GF15

GLASS FIBRE REINFORCED (15%) PA12 RESIN FOR THE INJECTION MOULDING OF RIGID AND TOUGH PARTS

VESTAMID® L-GF15 NC is a glass fiber –reinforced heat stabilized Polyamide 12 for injection molding. The material contains about 15% glass fibers, an ageing protective agent and a processing aid for a fast and even form filling. Due to the reinforcement moldings from this compound exhibit a higher strength and good heat resistance, excellent for gear housings for electric window openers in cars.

Further advantages of VESTAMID® L-GF15 NC are the characterizing properties of PA12, e.g., low water absorption, good dimensional stability and nearly constant mechanical properties at changing ambient humidity.

VESTAMID® L-GF15 NC is supplied as cylindrical granules, ready for processing, in moisture-proof bags.

The use of colorants may change 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
Automotive and Mobility, Industry and Engineering

Processing
Injection molding

Delivery form
Pellets, Granules

Resistance to
Heat (thermal stability), Oil / fuels

Electrical
Insulating

Conformity
Automotive

Additives
Glass fibers, Lubricant

LCA-values	dry	Unit	Test Standard
LCA name of certificate	VESTAMID® L GF low		ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	**24.5**	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	**5.5**	kg CO_2 eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	**5.5**	kg CO_2 eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	**0.1**	Annual crop eq. y	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	**609000 / 522000**	psi	ISO 527
Tensile strength	**13100 / 11700**	psi	ISO 527
Yield stress	**13100 / 11700**	psi	ISO 527
Yield strain	**4 / 4**	%	ISO 527
Stress at break	**12600 / 11500**	psi	ISO 527
Nominal strain at break, tB	**5 / 4**	%	ISO 527
Charpy impact strength, +23°C	**30.4 / 23.3**	ftlb/in²	ISO 179/1eU
Type of failure	**C / C**	-	-
Charpy impact strength, -30°C	**38.1 / 26.2**	ftlb/in²	ISO 179/1eU
Type of failure	**C / C**	-	-
Charpy notched impact strength, +23°C	**5.71 / 4.28**	ftlb/in²	ISO 179/1eA
Type of failure	**C / C**	-	-
Charpy notched impact strength, -30°C	**5.23 / 3.33**	ftlb/in²	ISO 179/1eA
Type of failure	**C / C**	-	-
Flexural modulus, 23°C	**534000 / 464000**	psi	ISO 178
Flexural stress at conv. deflection, 23°C	**17000 / 14200**	psi	ISO 178
Flexural strength, 23°C	**19600 / 16500**	psi	ISO 178
Flexural strain at flexural strength, 23°C	**5 / 6**	%	ISO 178

Flexural stress at break, 23°C	**17800 / 13800**	psi	ISO 178
Flexural strain at break, 23°C	**6 / 7**	%	ISO 178

Thermal properties	**dry / cond**	**Unit**	**Test Standard**
Melting temperature	**352 / ***	°F	ISO 11357-1/-3
Temp. of deflection under load A, 1.80 MPa	**320 / ***	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**347 / ***	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**347 / ***	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**338 / ***	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**4.44E-5 / ***	in/in/°F	ISO 11359-1/-2
Melting Temperature	**352**	°F	ASTM D 3418

Physical properties	**dry / cond**	**Unit**	**Test Standard**
Density	**1.12 / -**	g/cm³	ISO 1183
Water absorption	**1.3 / ***	%	Sim. to ISO 62
Humidity absorption	**0.6 / ***	%	Sim. to ISO 62
Density	**1.12**	g/cm³	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	**0.0630 / ***	in	-
Burnin behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.1181 / ***	in	-

Electrical properties	**dry / cond**	**Unit**	**Test Standard**
Volume resistivity, V	**>1E13 / 1.8E12**	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	**- / >1E15**	Ohm/sq	IEC 62631-3-2
Relative permittivity, 50Hz	**- / 5.6**	-	IEC 62631-2-1
Relative permittivity, 100Hz	**4 / 5.2**	-	IEC 62631-2-1

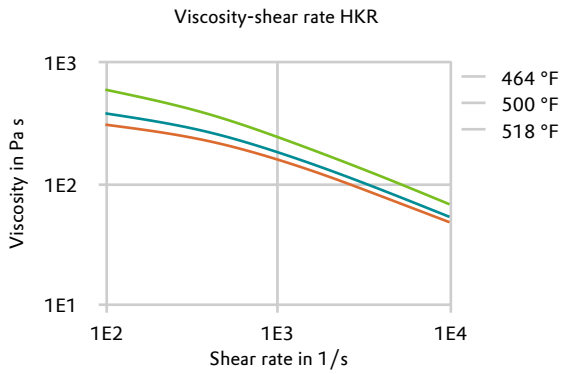
Relative permittivity, 1MHz	**3.4 / 3.3**	-	IEC 62631-2-1
Dissipation factor, 100Hz	**380 / -**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**260 / 450**	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	**1270 / 1190**	kV/in	IEC 60243-1
Dielectric strength, AC, S20/P50	**1120 / -**	V/mil	Sim. 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	**55 / ***	cm^3/10min	ISO 1133
Temperature	**275 / ***	°C	-
Load	**5 / ***	kg	-
Molding shrinkage, parallel	**0.3 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**0.7 / ***	%	ISO 294-4, 2577
Mold temperature	**176 / ***	°F	-
Melt temperature	**464 / ***	°F	-

Test specimen production	**dry**	**Unit**	**Test Standard**
Injection Molding, melt temperature	**500**	°F	ISO 294
Injection Molding, mold temperature	**176**	°F	ISO 294
Injection Molding, injection velocity	**7.87**	in/s	ISO 294
Injection Molding, pressure at hold	**10200**	psi	ISO 294

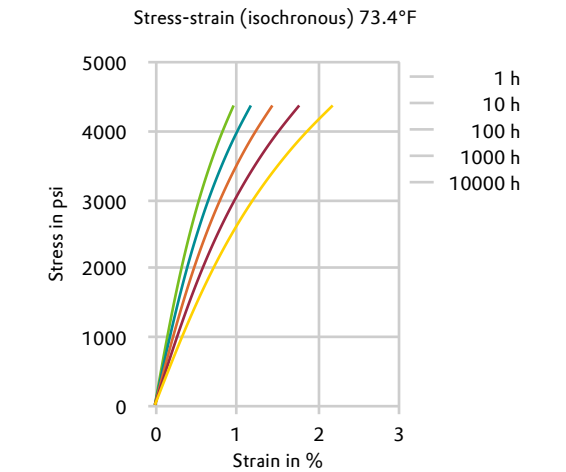
Diagrams

Viscosity-shear rate HKR



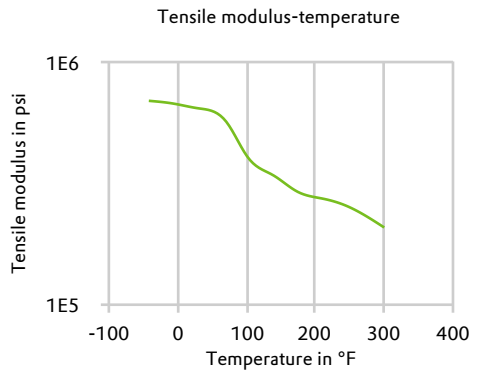
Shearstress-shear rate HKR

Stress-strain (isochronous) 73°F

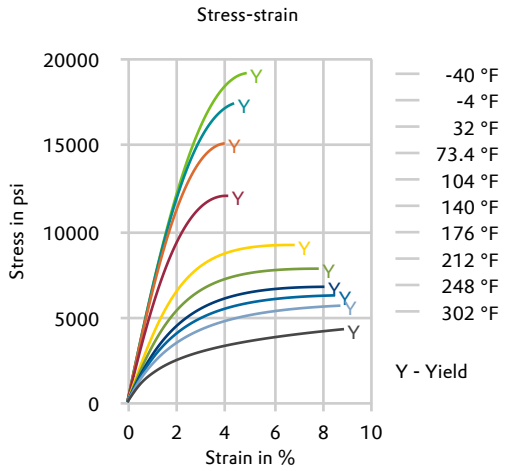


Creep modulus-time 73°F

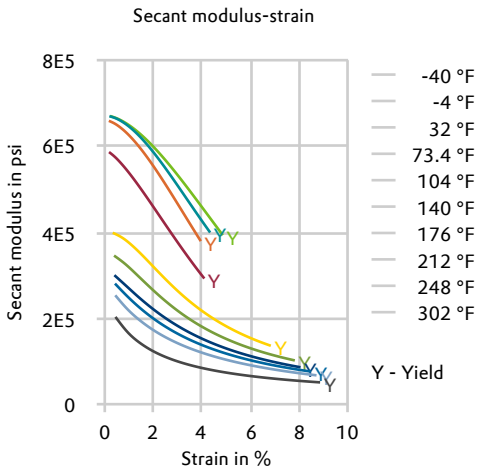
Tensile modulus-temperature



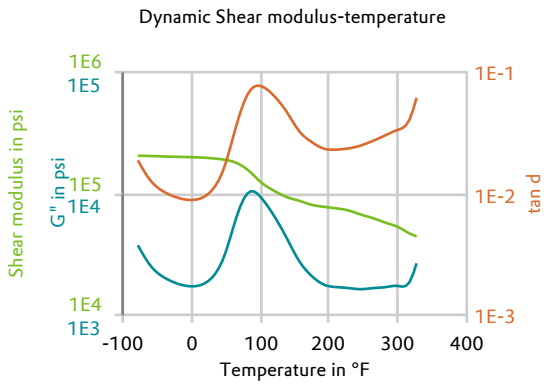
Stress-strain



Secant modulus-strain



Dynamic Shear modulus-temperature



VESTAMID®

Characteristics

Applications
Encapsulation

Color
Natural color

Special Characteristics
High heat resistant

Additives
Heat stabilizer, Processing aids

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	**86**	°F	-
Max. mold temperature	**212**	°F	-
Min. melt temperature	**446**	°F	-
Max. melt temperature	**518**	°F	-