

Product Information

# VESTAMID® L-GF30

## GLASS FIBER-REINFORCED AND HEAT STABILIZED POLYAMIDE 12

VESTAMID® L-GF30 NC is a glass fiber –reinforced heat stabilized Polyamide 12 for injection molding. The material contains about 30% 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.

Further advantages of VESTAMID® L-GF30 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-GF30 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, Sustainable, Industry and Engineering

#### Sustainability

Sustainable electricity

#### 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	<a href="#">VESTAMID® L GF medium</a>	-	ISO 14040, 14044
LCA certifier	<a href="#">TÜV Rheinland</a>	-	ISO 14040, 14044
Blue water consumption	<b>23.6</b>	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	<b>5.1</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	<b>5.1</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044
Land use (ReCiPe 2016)	<b>0.1</b>	Annual crop eq. y	ISO 14040, 14044
GWP savings as compared to 2023 reference	<b>-2.3</b>	kg CO <sub>2</sub> eq./kg	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	<b>6800 / 5500</b>	MPa	ISO 527
Tensile strength	<b>120 / -</b>	MPa	ISO 527
Yield stress	<b>- / 110</b>	MPa	ISO 527
Yield strain	<b>- / 5</b>	%	ISO 527
Stress at break	<b>118 / *</b>	MPa	ISO 527
Nominal strain at break, tB	<b>6 / 5.5</b>	%	ISO 527
Anisotropy ratio, tensile modulus	<b>0.65 / -</b>	-	-
Anisotropy ratio, tensile strength	<b>0.55 / -</b>	-	-
Charpy impact strength, +23°C	<b>93 / 75</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>C / C</b>	-	-
Charpy impact strength, -30°C	<b>100 / 95</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Type of failure	<b>C / C</b>	-	-
Charpy notched impact strength, +23°C	<b>27 / 24</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>P / C</b>	-	-
Charpy notched impact strength, -30°C	<b>21 / 22</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C / C</b>	-	-
Flexural modulus, 23°C	<b>5900 / -</b>	MPa	ISO 178

Flexural stress at conv. deflection, 23°C	<b>168 / -</b>	MPa	ISO 178
Flexural strength, 23°C	<b>188 / -</b>	MPa	ISO 178
Flexural strain at flexural strength, 23°C	<b>6 / -</b>	%	ISO 178
Flexural stress at break, 23°C	<b>182 / -</b>	MPa	ISO 178
Flexural strain at break, 23°C	<b>6 / -</b>	%	ISO 178
Taber Abrasion Resistance, S33, 2x 500g	<b>&lt; 15 / -</b>	mg/100 cycles	DIN 53754

<b>Thermal properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Melting temperature	<b>178 / *</b>	°C	ISO 11357-1/-3
Glass transition temperature, DSC	<b>42 / *</b>	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	<b>165 / *</b>	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	<b>175 / *</b>	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	<b>175 / *</b>	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	<b>175 / *</b>	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	<b>60 / *</b>	E-6/K	ISO 11359-1/-2
Melting Temperature	<b>178</b>	°C	ASTM D 3418

<b>Physical properties</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Density	<b>1240 / 1240</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>1.1 / *</b>	%	Sim. to ISO 62
Humidity absorption	<b>0.5 / *</b>	%	Sim. to ISO 62
Shore D hardness	<b>79 / -</b>	-	ISO 7619-1
Density	<b>1240</b>	kg/m <sup>3</sup>	ASTM D 792

<b>Burning Behav.</b>	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
UL Yellow Card available	<b>yes / *</b>	-	-
Burning behav. at 1.5 mm nom. thickn.	<b>HB / *</b>	class	IEC 60695-11-10
Thickness tested	<b>1.5 / *</b>	mm	-
Burnin behav. at thickness h	<b>HB / *</b>	class	IEC 60695-11-10

Thickness tested	<b>3.0 / *</b>	mm	-
Burning behav. at thickness h	<b>HB / *</b>	class	IEC 60695-11-10
Thickness tested	<b>0.8 / *</b>	mm	-
Hot Wire Ignition (HWI)	<b>3</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>0.8</b>	mm	-
Hot Wire Ignition (HWI)	<b>2</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>1.5</b>	mm	-
Hot Wire Ignition (HWI)	<b>1</b>	PL-Klasse	IEC 60695-2-20
HWI - thickness tested	<b>3.0</b>	mm	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	<b>&gt;1E13 / 2E12</b>	Ohm*m	IEC 62631-3-1
Surface resistivity, E	<b>*/ &gt;1E15</b>	Ohm	IEC 62631-3-2
Relative permittivity, 100Hz	<b>4.1 / 5</b>	-	IEC 62631-2-1
Relative permittivity, 1MHz	<b>3.4 / 4</b>	-	IEC 62631-2-1
Dissipation factor, 100Hz	<b>310 / 600</b>	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	<b>330 / 400</b>	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	<b>- / 45</b>	kV/mm	IEC 60243-1
Dielectric strength, AC, S20/P50	<b>44 / -</b>	kV/mm	Sim. to IEC 60243-1
CTI, test solution A, 50 drops value	<b>600 / 600</b>	-	IEC 60112
Assessment of the insulation group	<b>I</b>	-	DIN EN 60664-1
CTI, Performance Level Categories, PLC	<b>0</b>	class	ASTM D 3638

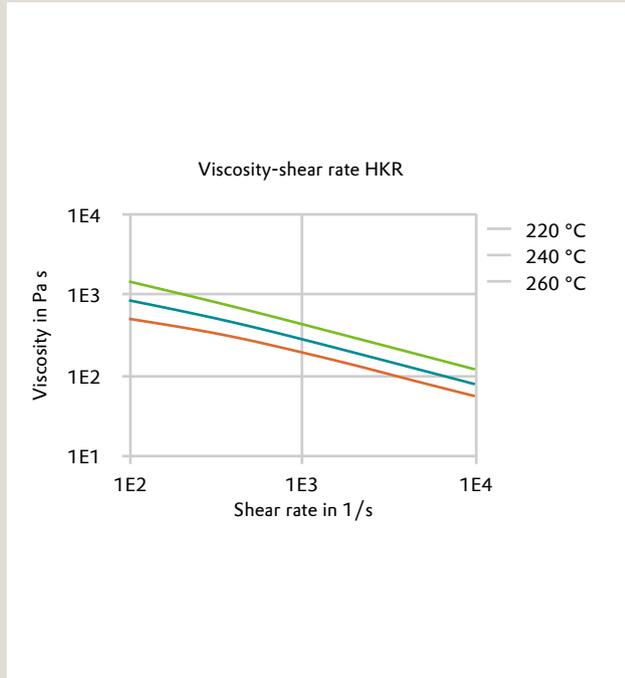
Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	<b>30 / *</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>275 / *</b>	°C	-
Load	<b>5 / *</b>	kg	-
Melt volume-flow rate, MVR	<b>33 / *</b>	cm <sup>3</sup> /10min	ISO 1133

Temperature	<b>230 / *</b>	°C	-
Load	<b>2.16 / *</b>	kg	-
Molding shrinkage, parallel	<b>0.1 / *</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>0.7 / *</b>	%	ISO 294-4, 2577
Mold temperature	<b>80 / *</b>	°C	-
Melt temperature	<b>250 / *</b>	°C	-

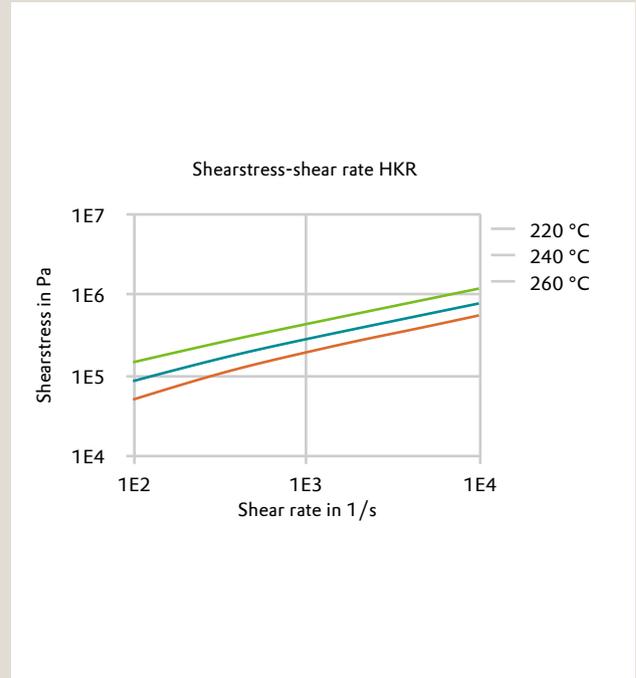
<b>Test specimen production</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Injection Molding, melt temperature	<b>250</b>	°C	ISO 294
Injection Molding, mold temperature	<b>80</b>	°C	ISO 294
Injection Molding, injection velocity	<b>200</b>	mm/s	ISO 294
Injection Molding, pressure at hold	<b>70</b>	MPa	ISO 294

Diagrams

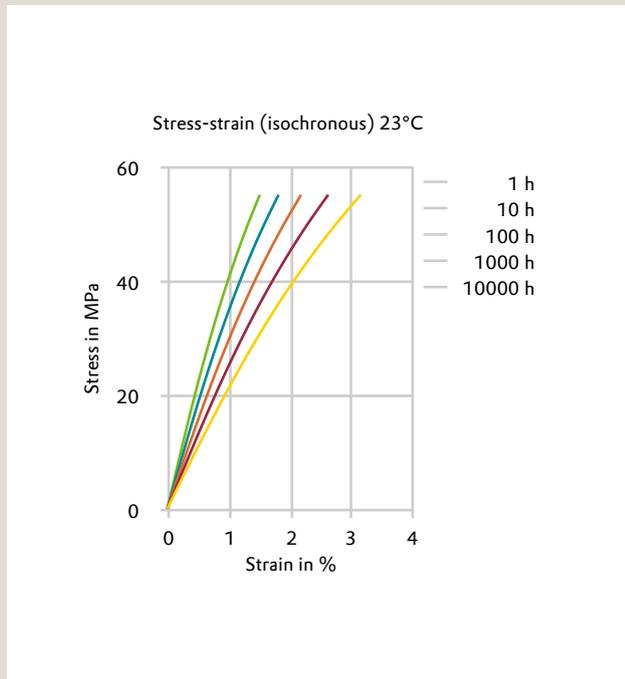
Viscosity-shear rate HKR



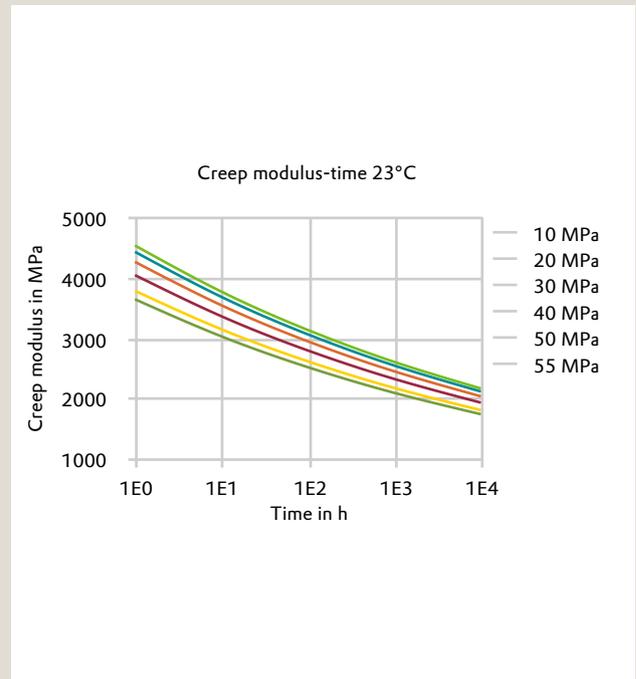
Shearstress-shear rate HKR



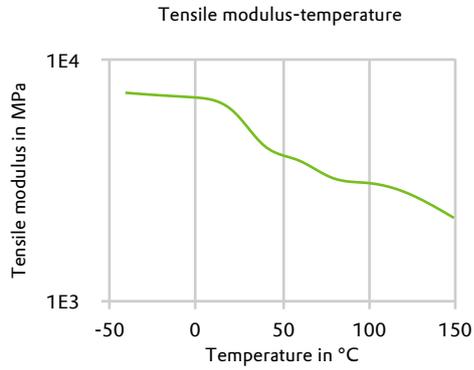
Stress-strain (isochronous) 23°C



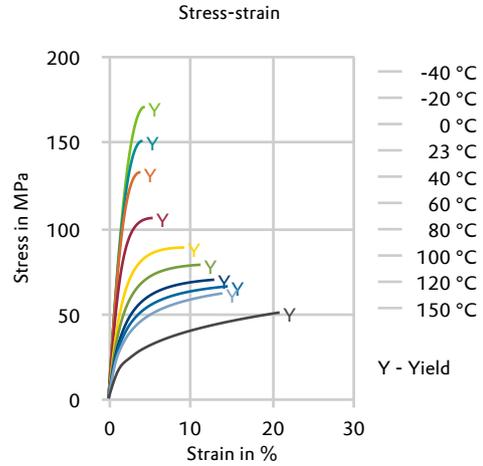
Creep modulus-time 23°C



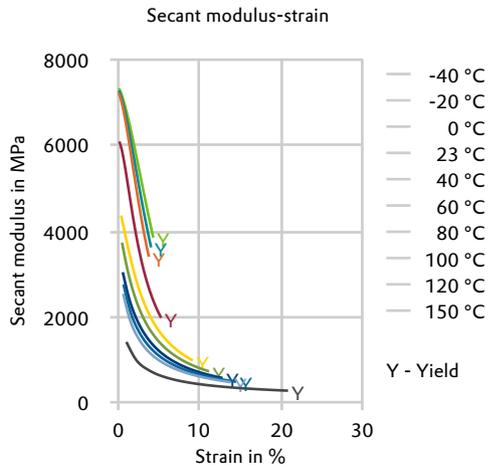
Tensile modulus-temperature



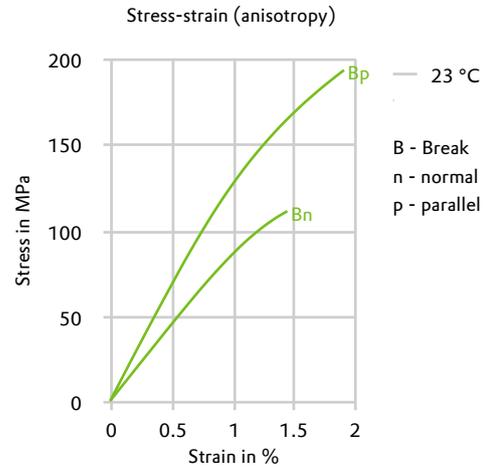
Stress-strain



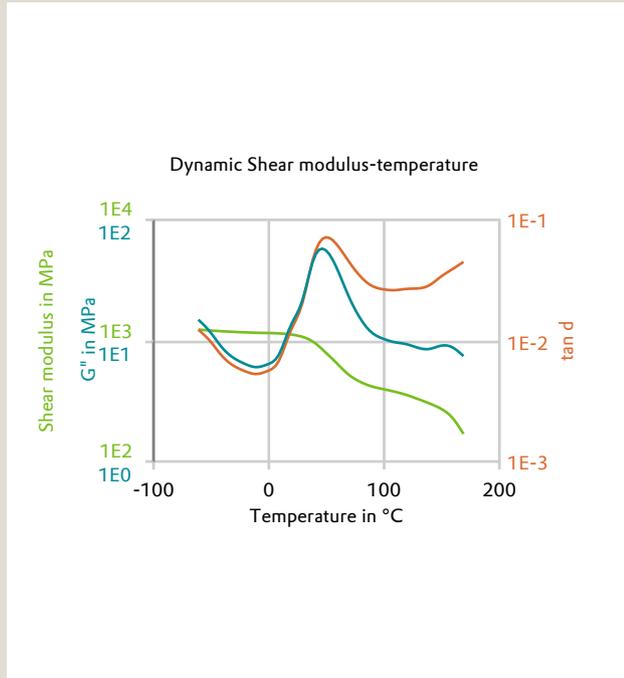
Secant modulus-strain



Stress-strain (anisotropy)



**Dynamic Shear modulus-temperature**



**Characteristics**

**Special Characteristics**

High heat resistant

**Color**

Natural color

**Additives**

Antioxidant agent, 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**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Density of melt	<b>1090</b>	kg/m <sup>3</sup>	-
Thermal conductivity of melt	<b>0.28</b>	W/(m K)	-
Spec. heat capacity of melt	<b>2400</b>	J/(kg K)	-
Ejection temperature	<b>180</b>	°C	-
Min. mold temperature	<b>30</b>	°C	-
Max. mold temperature	<b>100</b>	°C	-
Min. melt temperature	<b>240</b>	°C	-
Max. melt temperature	<b>280</b>	°C	-