

**Grilamid L 25 nat**  
 PA12

EMS-GRIVORY | a unit of EMS-CHEMIE AG

**Product Texts**

Product designation according to ISO 1874:

PA 12, E, 24-010

Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	<b>1400 / 1100</b>	MPa	ISO 527-1/-2
Yield stress	<b>45 / 40</b>	MPa	ISO 527-1/-2
Yield strain	<b>10 / 12</b>	%	ISO 527-1/-2
Nominal strain at break	<b>&gt;50 / &gt;50</b>	%	ISO 527-1/-2
Stress at break	<b>50 / 45</b>	MPa	ISO 527-1/-2
Charpy impact strength (+23°C)	<b>N / N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength (-30°C)	<b>N / N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength (+23°C)	<b>- / 10</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength (-30°C)	<b>- / 7</b>	kJ/m <sup>2</sup>	ISO 179/1eA

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature (10°C/min)	<b>178 / -</b>	°C	ISO 11357-1/-3
Max. usage temperature (short term)	<b>150</b>	°C	EMS

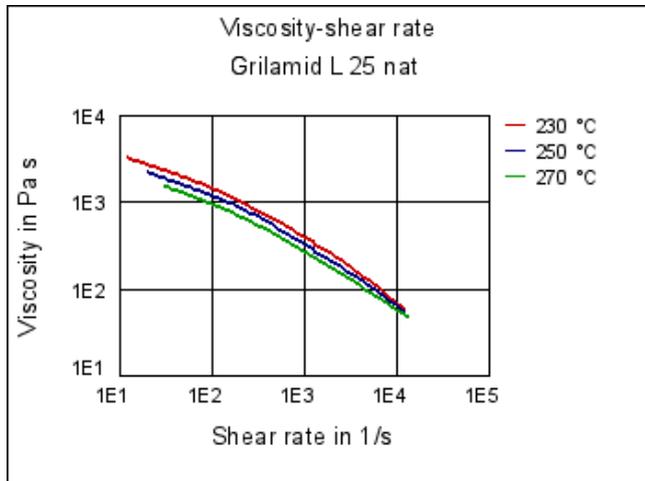
Other properties	dry / cond	Unit	Test Standard
Water absorption	<b>1.5 / -</b>	%	Sim. to ISO 62
Humidity absorption	<b>0.7 / -</b>	%	Sim. to ISO 62
Density	<b>1010 / -</b>	kg/m <sup>3</sup>	ISO 1183

Film Properties	dry / cond	Unit	Test Standard
Stress at yield (parallel)	<b>35 / -</b>	MPa	ISO 527-3
Stress at yield (normal)	<b>35 / -</b>	MPa	ISO 527-3
Strain at yield (parallel)	<b>6 / -</b>	%	ISO 527-3
Strain at yield (normal)	<b>6 / -</b>	%	ISO 527-3
Maximum strain (parallel)	<b>850 / -</b>	%	ISO 527-3
Maximum strain (normal)	<b>900 / -</b>	%	ISO 527-3
Elmendorf Tear resistance (parallel)	<b>10 / -</b>	N	ISO 6383-2
Elmendorf Tear resistance (normal)	<b>10 / -</b>	N	ISO 6383-2
Trouser Tear resistance (parallel)	<b>20 / -</b>	N/mm	ISO 6383-1
Trouser Tear resistance (normal)	<b>25 / -</b>	N/mm	ISO 6383-1
Gloss, 60°	<b>150 / -</b>	-	ISO 2813
WVTR (23°C/85%r.h.)	<b>8 / -</b>	g/(m <sup>2</sup> *d)	ISO 15106-1/-2
Oxygen transmission rate (23°C/0%r.h.)	<b>350 / -</b>	cm <sup>3</sup> /(m <sup>2</sup> *d*bar)	ISO 15105-1/-2
Oxygen transmission rate (23°C/85%r.h.)	<b>370 / -</b>	cm <sup>3</sup> /(m <sup>2</sup> *d*bar)	ISO 15105-1/-2
Carbon Dioxide transm. rate (23°C/0%r.h.)	<b>1500 / -</b>	cm <sup>3</sup> /(m <sup>2</sup> *d*bar)	ISO 15105-1/-2
Carbon Dioxide transm. rate (23°C/85%r.h.)	<b>1600 / -</b>	cm <sup>3</sup> /(m <sup>2</sup> *d*bar)	ISO 15105-1/-2
Stress at break (parallel)	<b>80</b>	MPa	ISO 527-3
Stress at break (normal)	<b>70</b>	MPa	ISO 527-3
Gelboflectest	<b>1300</b>	holes/m <sup>2</sup>	EMS

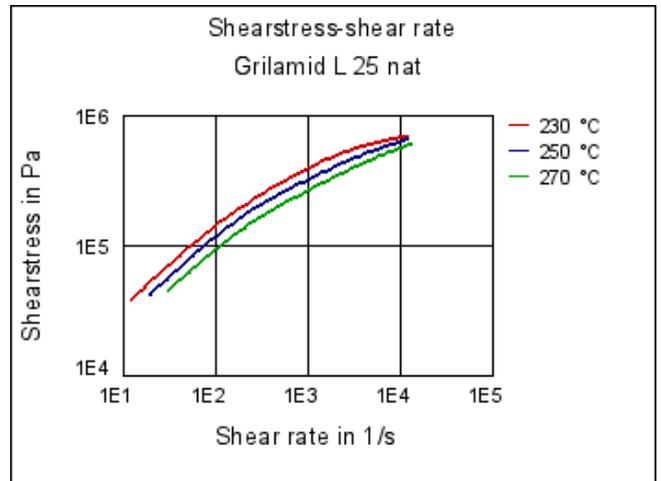
Rheo/Phys properties	dry / cond	Unit	Test Standard
Melt volume-flow rate (MVR)	<b>20 / -</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>275 / -</b>	°C	ISO 1133
Load	<b>5 / -</b>	kg	ISO 1133

**Diagrams**

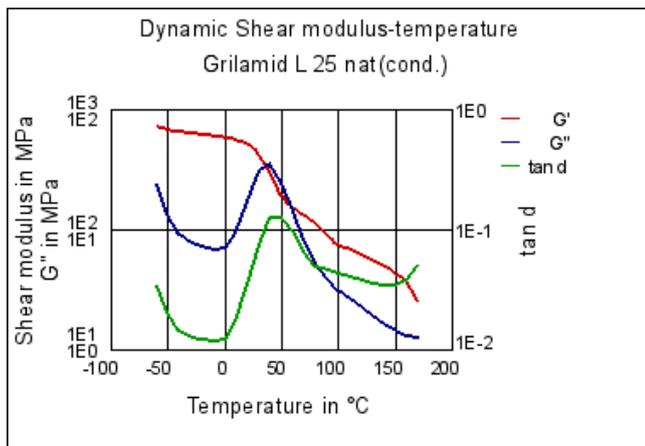

Viscosity-shear rate



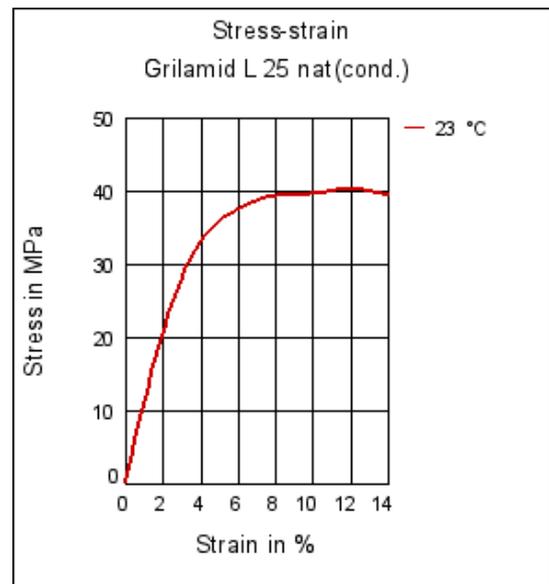
Shearstress-shear rate



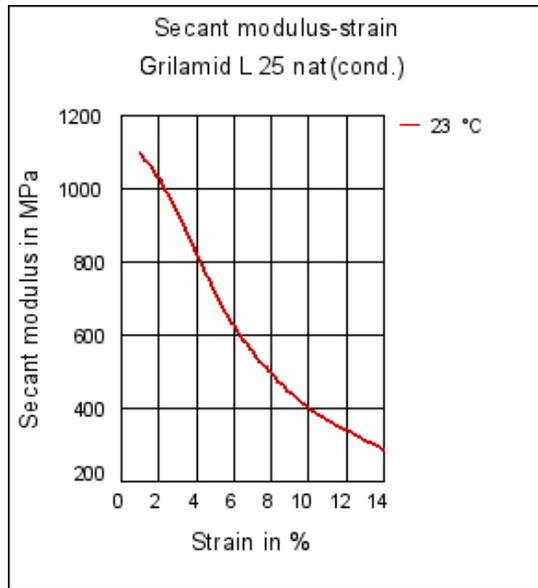
Dynamic Shear modulus-temperature



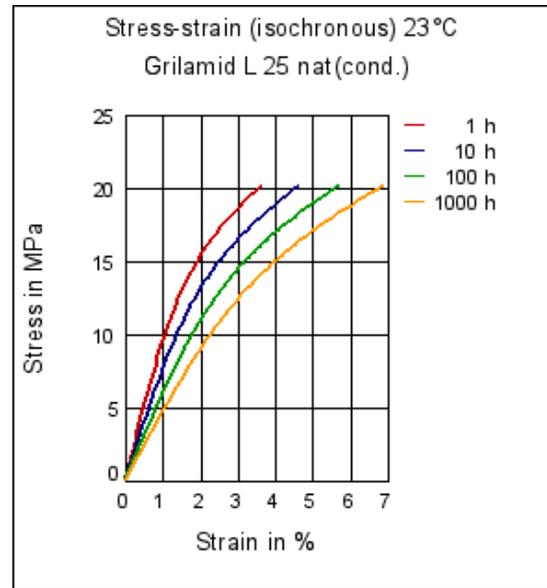
Stress-strain



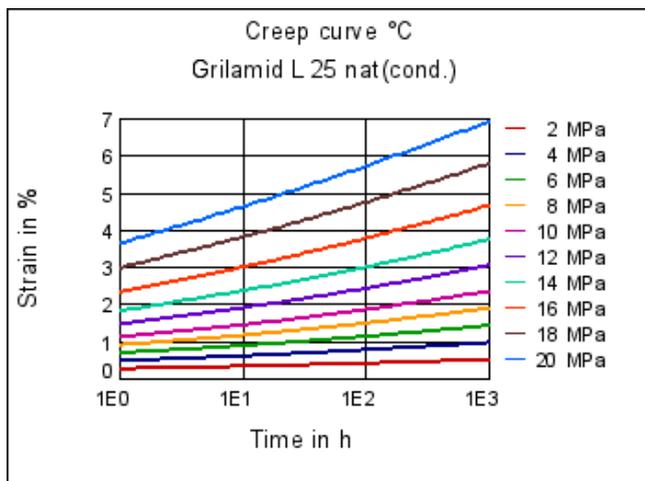
Secant modulus-strain



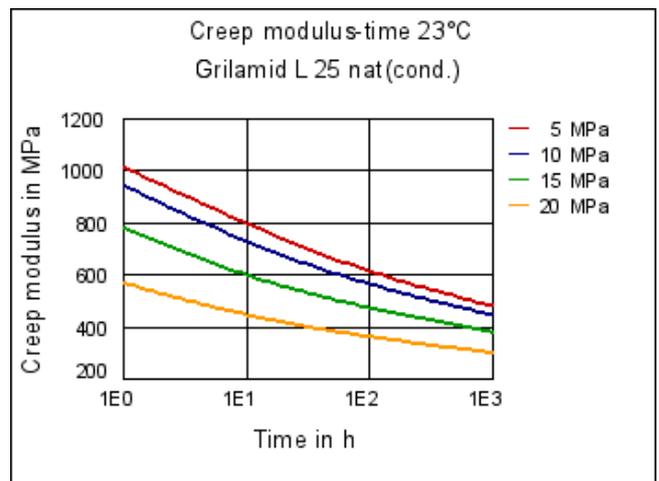
Stress-strain (isochronous) 23°C



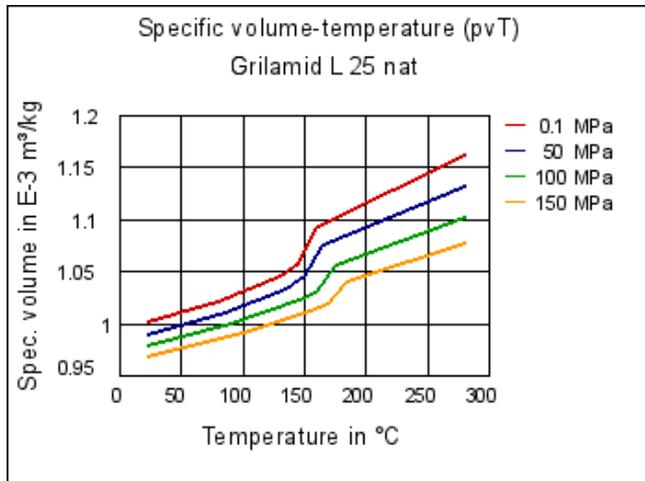
Creep curve °C



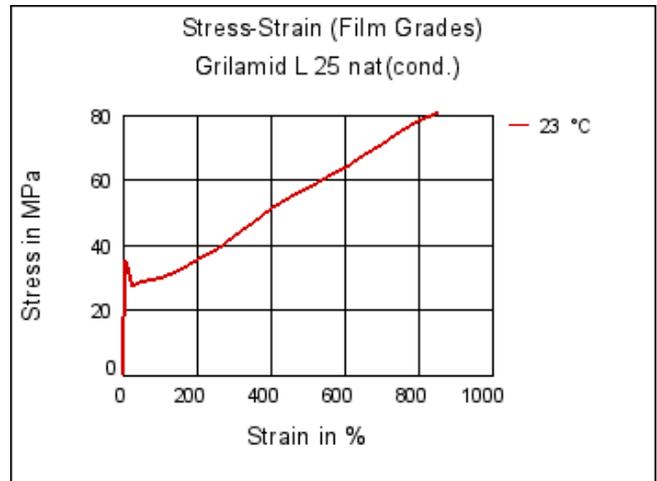
Creep modulus-time 23°C



Specific volume-temperature (pvT)



Stress-Strain (Film Grades)



Characteristics

Processing

Injection Molding, Extrusion - cast film, Other Extrusion

Delivery form

Granules

Regional Availability

North America, Europe, Asia Pacific, South and Central America, Near East/Africa

Product Attributes

High viscosity

Industry & Consumer goods

Medical devices

Packaging

Non oriented film

Food Contact

EU Requirements, FDA

Biocompatibility

USP VI

Chemical Media Resistance

Acids

- ☺ Acetic Acid (5% by mass) (23°C)
- ☺ Citric Acid solution (10% by mass) (23°C)
- ☺ Lactic Acid (10% by mass) (23°C)
- ⊖ Hydrochloric Acid (36% by mass) (23°C)
- ⊖ Nitric Acid (40% by mass) (23°C)
- ☺ Sulfuric Acid (38% by mass) (23°C)
- ☺ Sulfuric Acid (5% by mass) (23°C)
- ⊖ Chromic Acid solution (40% 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)
- ☺ SAE 10W40 multigrade motor oil (130°C)
- ☺ SAE 80/90 hypoid-gear oil (130°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 fuel (pref. ISO 1817 Liquid F) (>90°C)

#### Salt solutions

- ☺ Sodium Chloride solution (10% by mass) (23°C)
- ☺ Sodium Hypochlorite 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 (130°C)
- ☺ Ethylene Glycol (50% by mass) in water (108°C)
- ☺ 1% nonylphenoxy-polyethyleneoxy ethanol in water (23°C)
- ☺ 50% Oleic acid + 50% Olive Oil (23°C)
- ☺ Water (23°C)
- ☺ Deionized water (90°C)
- ☹ Phenol solution (5% by mass) (23°C)

