CAMPUS® Datasheet

Grilamid TR 90 - PAMACM12
EMS-GRIVORY | a unit of EMS-CHEMIE AG

Product Texts

Product designation according to ISO 1874:
PA MACM12, GT,14-020

Product Attributes

Highly transparent

Markets

Automotive
Automotive electr. and electronics, lighting, Cooling and climate control, Fuel systems, Powertrain and Chassis , Interior
Electricals & Electronics
Electrical appliances, Electrical equipment, Connectors, Mobile phones and other portable devices, Lighting
Industry & Consumer goods
Heating systems, Housewares, Hydraulics & Pneumatics, Mechanical Engineering, Medical devices, Power transmission, Sanitary, water and gas supply, Sports & Leisure, Tools & Accessories
Optics
Lenses, Optical components, Safety glasses, Sunglasses, Spectacle frames
Packaging
Non oriented film, Cosmetics / Personal care, Medical packaging

Approvals

Food Contact
EU Requirements, FDA
Biocompatibility
USP VI, ISO 10993
Potable Water Contact
NSF 61, KTW, WRAS, DVGW W270

Rheological properties	dry / cond	Unit	Test Standard
Molding shrinkage, parallel	**0.7 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**0.8 / ***	%	ISO 294-4, 2577
Mechanical properties	**dry / cond**	**Unit**	**Test Standard**
Tensile modulus	**1600 / 1600**	MPa	ISO 527-1/-2
Yield stress	**60 / 60**	MPa	ISO 527-1/-2
Yield strain	**6 / 6**	%	ISO 527-1/-2
Nominal strain at break	**>50 / >50**	%	ISO 527-1/-2
Charpy impact strength, +23°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**N / N**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, +23°C	**9 / 13**	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	**9 / 12**	kJ/m²	ISO 179/1eA
Thermal properties	**dry / cond**	**Unit**	**Test Standard**
Glass transition temperature, 10°C/min	**155 / ***	°C	ISO 11357-1/-2
Temp. of deflection under load, 1.80 MPa	**115 / ***	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	**135 / ***	°C	ISO 75-1/-2
Coeff. of linear therm. expansion, parallel	**90 / ***	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	**90 / ***	E-6/K	ISO 11359-1/-2
Burning Behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested (h)	**0.8 / ***	mm	IEC 60695-11-10

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity	**- / 1E11**	Ohm*m	IEC 62631-3-1
Surface resistivity	*** / 1E12**	Ohm	IEC 62631-3-2
Electric strength	**- / 34**	kV/mm	IEC 60243-1
Comparative tracking index	**- / 600**	-	IEC 60112

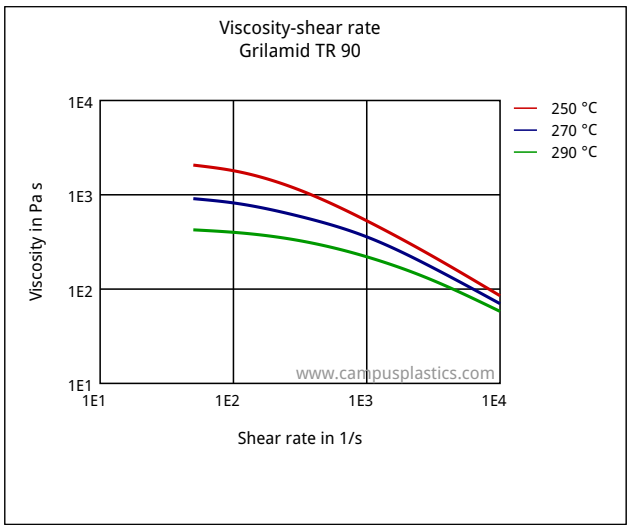
Other properties	dry / cond	Unit	Test Standard
Water absorption	**3 / ***	%	Sim. to ISO 62
Humidity absorption	**1.5 / ***	%	Sim. to ISO 62
Density	**1000 / -**	kg/m³	ISO 1183

Rheological calculation properties	Value	Unit	Test Standard
Density of melt	**940**	kg/m³	-
Thermal conductivity of melt	**0.2**	W/(m K)	-
Spec. heat capacity melt	**2200**	J/(kg K)	-
Eff. thermal diffusivity	**9.67E-8**	m²/s	-
Ejection temperature	**150**	°C	-

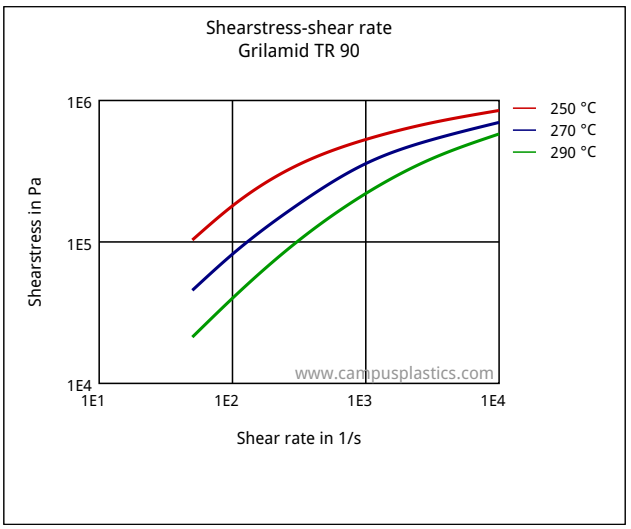
Test specimen production	Value	Unit	Test Standard
Injection Molding, melt temperature	**280**	°C	ISO 294
Injection Molding, mold temperature	**80**	°C	ISO 294
Injection Molding, injection velocity	**250**	mm/s	ISO 294
Injection Molding, pressure at hold	**75**	MPa	ISO 294

Diagrams

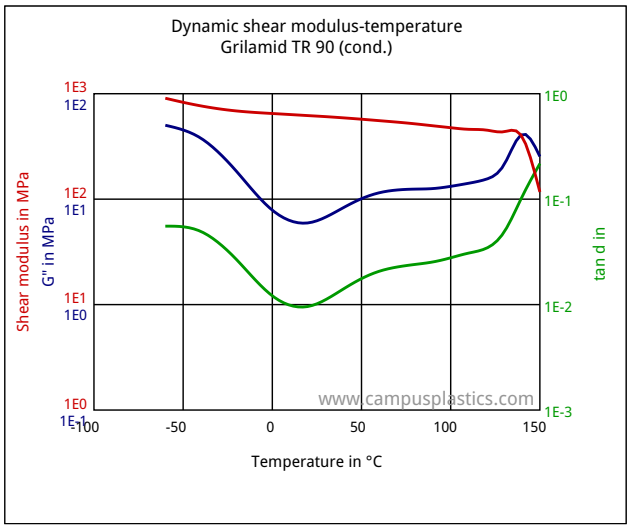
Viscosity-shear rate



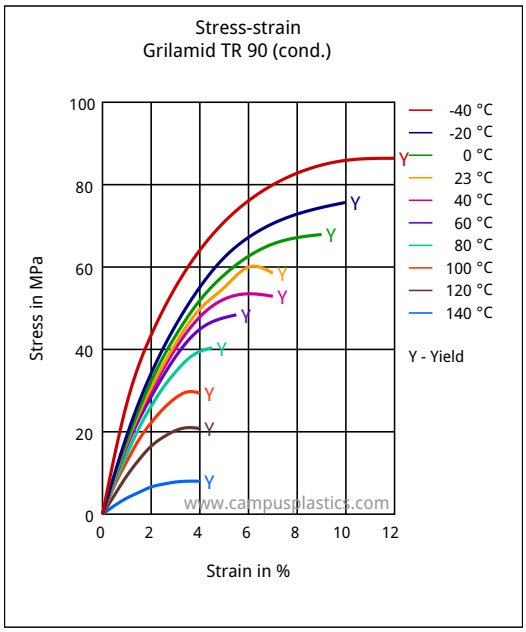
Shearstress-shear rate



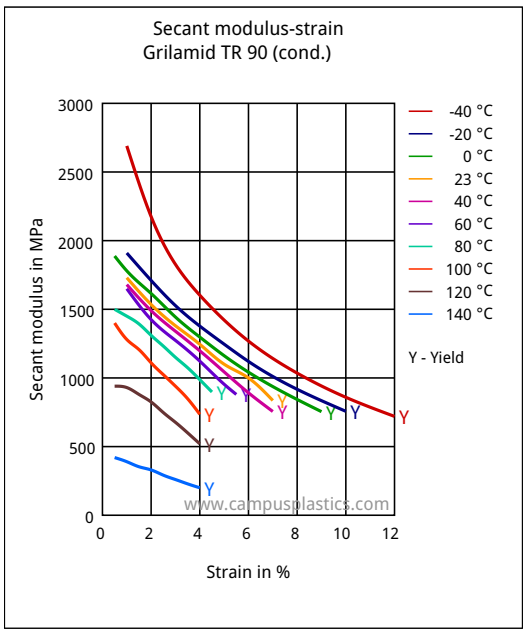
Dynamic shear modulus-temperature



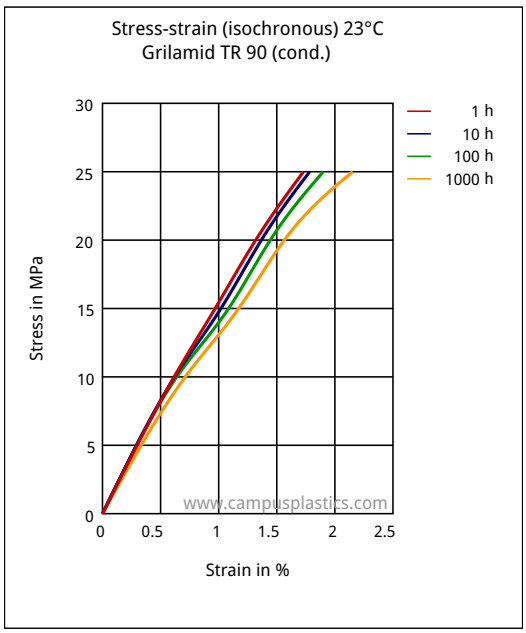
Stress-strain



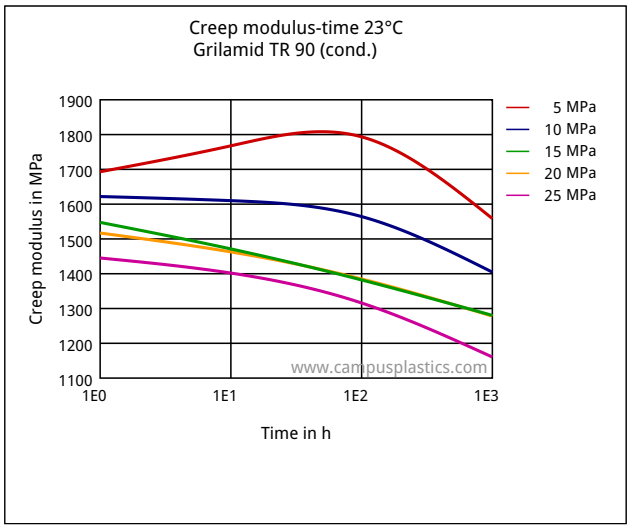
Secant modulus-strain



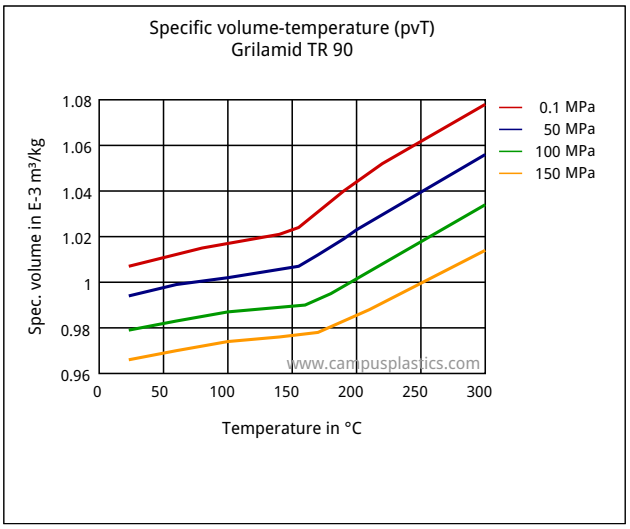
Stress-strain (isochronous) 23°C



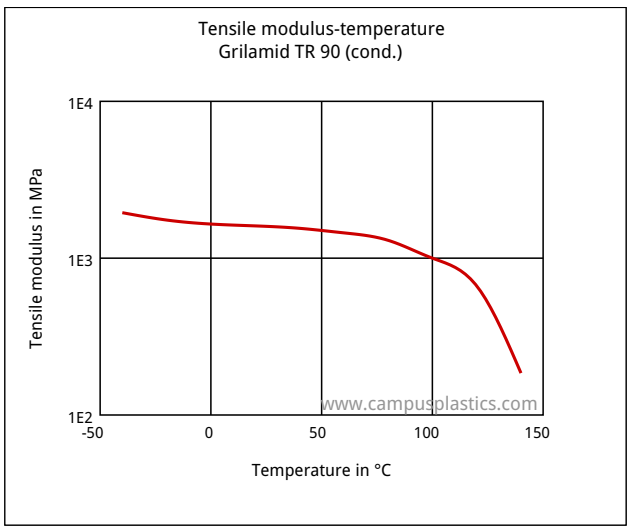
Creep modulus-time 23°C



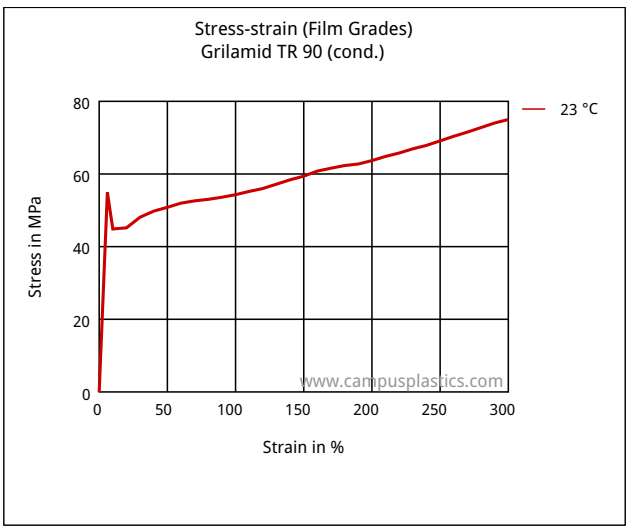
Specific volume-temperature (pvT)



Tensile modulus-temperature



Stress-strain (Film Grades)



Characteristics

Processing
Injection Molding, Other Extrusion

Special Characteristics
Transparent

Delivery form
Granules

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

Other text information

Injection molding
PREPROCESSING
Max. water content : <= 0.08 %
PROCESSING
Melt temperature : 275 °C
Mould wall temperature : 80 °C
Holding pressure : 300-600 bar

Screw : 50-100 rpm
Back pressure : 1-15 bar
Injection speed : 3
(1=slow, 3=medium, 5=fast)

Please consider the information about the application of the materials.

Other extrusion

-- PIPE EXTRUSION --
-- SHEATING --
PROCESSING
Melt temperature : 250-270 °C
Feeding bush : 60-90
Barrel temp. profile : 240-250 °C
Head temp. : 250-240 °C

Please consider the information about the application of the materials.

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)

EMS-CHEMIE AG
Business Unit EMS-GRIVORY

Homepage: EMS-GRIVORY
eMail: welcome@emsgrivory.com