

# Grivory GV-4H

# EMS-GRIVORY | a unit of EMS-CHEMIE AG

#### **Product Information**

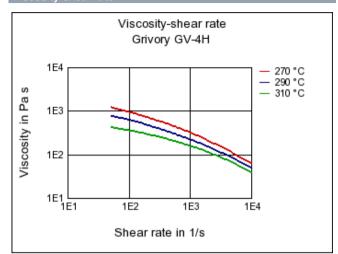
Product designation according to ISO 1874:

PA66+PA6I/X, MH, 14-140, GF40

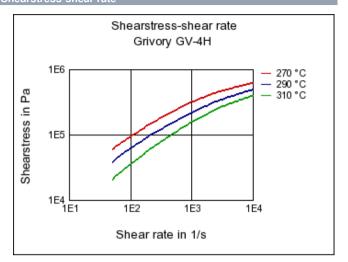
Mechanical properties	dry / cond	Unit	Test Standard
Tensile Modulus	14000 / 13000	MPa	ISO 527-1/-2
Stress at break	230 / 210	MPa	ISO 527-1/-2
Strain at break	3 / 3	%	ISO 527-1/-2
Charpy impact strength (+23°C)	90 / 90	kJ/m²	ISO 179/1eU
Charpy impact strength (-30°C)	70 / 70	kJ/m²	ISO 179/1eU
Charpy notched impact strength (+23°C)	13 / 13	kJ/m²	ISO 179/1eA
Charpy notched impact strength (-30 °C)	11 / 11	kJ/m²	ISO 179/1eA
Mechanical properties (TPE)	dry / cond	Unit	Test Standard
Ball indentation hardness	255 / 230	MPa	ISO 2039-1
Dan modification nationals	200 / 200	······································	100 2000 1
Thermal properties	dry / cond	Unit	Test Standard
Melting temperature (10°C/min)	260 / -	°C	ISO 11357-1/-3
Temp. of deflection under load (1.80 MPa)	235 / -	°C	ISO 75-1/-2
Temp. of deflection under load (1.80 MPa)	145 / -	°C	ISO 75-1/-2
	15 / -		
Coeff. of linear therm. expansion (parallel)		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	0.8 / -	mm	IEC 60695-11-10
Max. usage temperature (long term)	100 - 120	°C	EMS
Max. usage temperature (short term)	220	°C	EMS
Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity	1E12 / 1E12	Ohm*m	IEC 60093
Surface resistivity	- / 1E13	Ohm	IEC 60093
Electric strength	33 / 33	kV/mm	IEC 60243-1
Comparative tracking index	- / 600	-	IEC 60112
Other properties	dry / cond	Unit	Test Standard
Water absorption	4.5 / -	%	Sim. to ISO 62
Humidity absorption	1.4 / -	%	Sim. to ISO 62
Density	1470 / -	kg/m³	ISO 1183
Bonony		1.9/111	100 1100
Rheo/Phys properties	dry / cond	Unit	Test Standard
Molding shrinkage (parallel)	0.1 / -	%	ISO 294-4, 2577
Molding shrinkage (normal)	0.6 / -	%	ISO 294-4, 2577

#### Diagrams

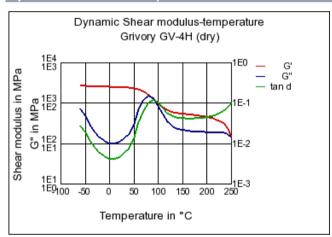
#### Viscosity-shear rate



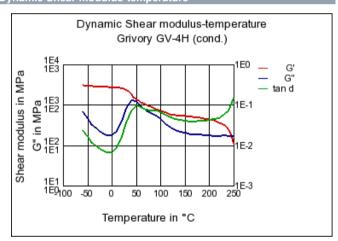
#### Shearstress-shear rate



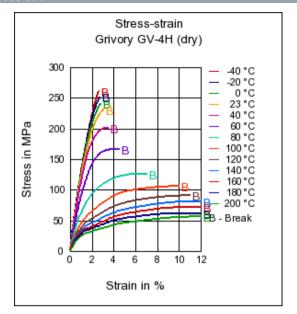
#### Dynamic Shear modulus-temperature



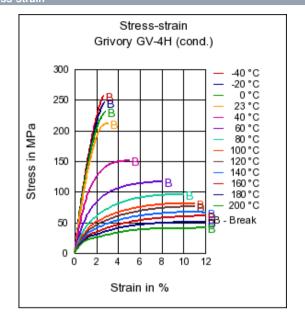
#### Dynamic Shear modulus-temperature



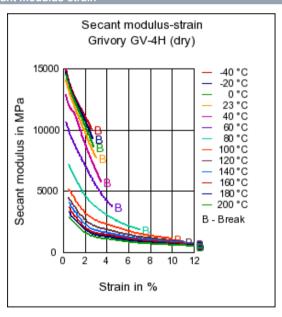
#### Stress-strain



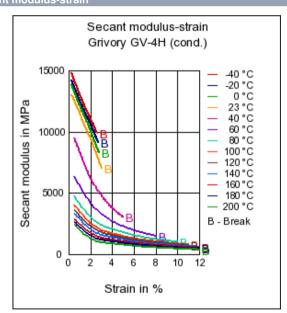
#### Stress-strain



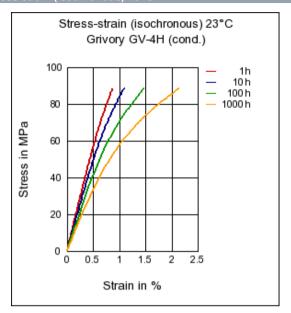
#### Secant modulus-strain



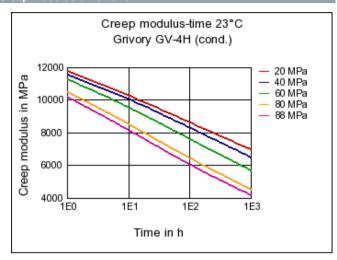
# Secant modulus-strain



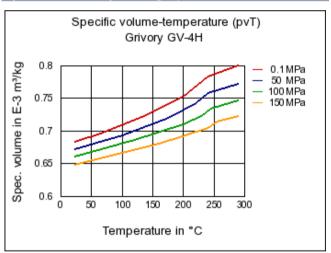
#### Stress-strain (isochronous) 23°C



#### Creep modulus-time 23°C



# Specific volume-temperature (pvT)



# Characteristic

# Processing

Injection Molding

## Regional Availability

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

#### **Product Attributes**

Partially aromatic Polyamide

#### Automotive

Air intake sytems, Automotive electr. and electronics, lighting, Cooling and climate control, Powertrain and Chassis , Interior, Exterior

#### Electricals & Electronics

Electrical appliances, Electrical equipment, Energy distribution

# **Industry & Consumer goods**

Housewares, Hydraulics & Pneumatics, Mechanical Engineering

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Power transmission, Sanitary, water and gas supply, Sports & Leisure, Tools & Accessories

#### **Chemical Media Resistance**

#### Acids

- Acetic Acid (5% by mass) (23°C)
- Chromic Acid solution (40% by mass) (23°C)
- Citric Acid solution (10% by mass) (23°C)
- Hydrochloric Acid (36% by mass) (23°C)
- Lactic Acid (10% 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)

#### Bases

- Ammonium Hydroxide solution (10% by mass) (23°C)
- Sodium Hydroxide solution (1% by mass) (23°C)
- Sodium Hydroxide solution (35% by mass) (23°C)

#### Alcohols

- ethanol (23°C)
- Isopropyl alcohol (23°C)
- Methanol (23°C)

#### Hydrocarbons

- U Toluene (23°C)
- iso-Octane (23°C)
- n-Hexane (23°C)

## Ketones

Acetone (23°C)

# Ethers

Diethyl ether (23°C)

#### Mineral oils

- Insulating Oil (23°C)
- SAE 10W40 multigrade motor oil (130°C)
- SAE 10W40 multigrade motor oil (23°C)
- SAE 80/90 hypoid-gear oil (130°C)

# Standard Fuels

- Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- Diesel fuel (pref. ISO 1817 Liquid F) (90°C)

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- Diesel fuel (pref. ISO 1817 Liquid F) (>90°C)
- USO 1817 Liquid 1 (60°C)
- ISO 1817 Liquid 3 (60°C)
- ISO 1817 Liquid 4 (60°C)
- Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23°C)
- UStandard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)

# Salt solutions

- Sodium Carbonate solution (2% by mass) (23°C)
- Sodium Carbonate solution (20% by mass) (23°C)
- Sodium Chloride solution (10% by mass) (23°C)
- Sodium Hypochlorite solution (10% by mass) (23°C)
- Zinc Chloride solution (50% by mass) (23°C)

#### Other

- 1% nonylphenoxy-polyethyleneoxy ethanol in water (23°C)
- 50% Oleic acid + 50% Olive Oil (23°C)
- OT No. 4 Brake fluid (130°C)
- Deionized water (90°C)
- ethyl Acetate (23°C)
- Ethylene Glycol (50% by mass) in water (108°C)
- Hydrogen peroxide (23°C)
- Phenol solution (5% by mass) (23°C)
- Water (23°C)