

# Grilamid TR 55 LX PA12/MACMI

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

## Product Texts

Product designation according to ISO 1874: PA 12/MACMI + PA 12, GHLT, 14-020

| 1 A 12/MAOMI 1 1 A 12, OHL1, 14 020          |                   |              |                 |
|--|-------------------|--------------|-----------------|
| Mechanical properties                        | dry / cond        | Unit         | Test Standard   |
| Tensile Modulus                              | 2000 / 1900       | MPa          | ISO 527-1/-2    |
| Yield stress                                 | 75 / 70           | MPa          | ISO 527-1/-2    |
| Yield strain                                 | 7/6               | %            | ISO 527-1/-2    |
| Nominal strain at break                      | >50 / >50         | %            | ISO 527-1/-2    |
| Stress at break                              | - / 40            | MPa          | ISO 527-1/-2    |
| Charpy impact strength (+23°C)               | - / N             | kJ/m²        | ISO 179/1eU     |
| Charpy impact strength (-30°C)               | - / N             | kJ/m²        | ISO 179/1eU     |
| Charpy notched impact strength (+23°C)       | -/9               | kJ/m²        | ISO 179/1eA     |
| Charpy notched impact strength (-30°C)       | -/8               | kJ/m²        | ISO 179/1eA     |
| Mechanical properties (TPE)                  | dry / cond        | Unit         | Test Standard   |
| Ball indentation hardness                    | - / 110           | MPa          | ISO 2039-1      |
|  |                   |              |                 |
| Thermal properties                           | dry / cond        | Unit         | Test Standard   |
| Glass transition temperature (10°C/min)      | 110 / -           | °C           | ISO 11357-1/-2  |
| Temp. of deflection under load (1.80 MPa)    | 80 / -            | °C           | ISO 75-1/-2     |
| Temp. of deflection under load (0.45 MPa)    | 90 / -            | °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                             | 0.8 / -           | mm           | IEC 60695-11-10 |
| Max. usage temperature (long term)           | 80                | °C           | EMS             |
| Max. usage temperature (short term)          | 95                | °C           | EMS             |
| Electrical properties                        | dry / cond        | Unit         | Test Standard   |
| Volume resistivity                           | - / 1E11          | Ohm*m        | IEC 60093       |
| Surface resistivity                          | -/ 1E12           | Ohm          | IEC 60093       |
| Electric strength                            | -/ IE12<br>-/ 32  | kV/mm        | IEC 60093       |
| Comparative tracking index                   | - / 32<br>- / 600 | K V/IIIIII   | IEC 60243-1     |
| Comparative tracking index                   | - 7 000           | <del>_</del> | 120 00112       |
| Other properties                             | dry / cond        | Unit         | Test Standard   |
| Water absorption                             | 2.5 / -           | %            | Sim. to ISO 62  |
| Humidity absorption                          | 1/-               | %            | Sim. to ISO 62  |
| Density                                      | 1040 / -          | kg/m³        | ISO 1183        |
|  |                   |              |                 |

## Diagrams

Rheo/Phys properties

Molding shrinkage (parallel)

Molding shrinkage (normal)

Test Standard

ISO 294-4, 2577

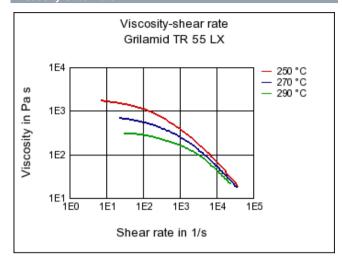
ISO 294-4, 2577

0.5/-

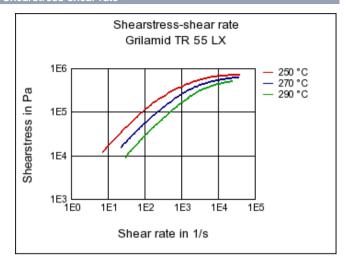
0.6/-

%

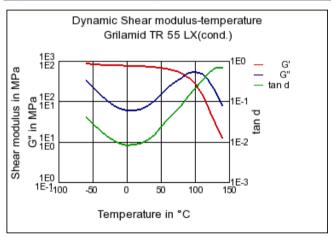
#### Viscosity-shear rate



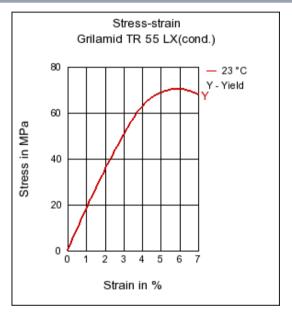
### Shearstress-shear rate



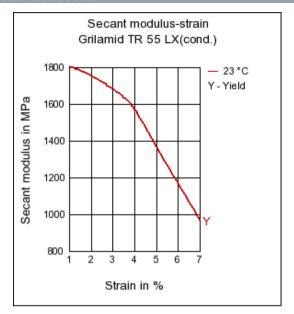
#### Dynamic Shear modulus-temperature



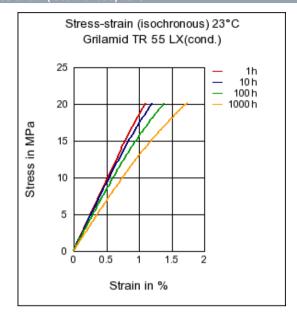
## Stress-strain



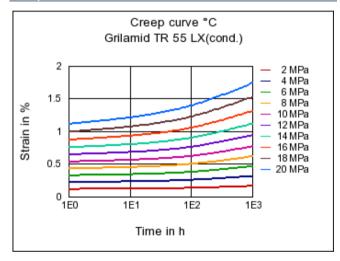
#### Secant modulus-strain



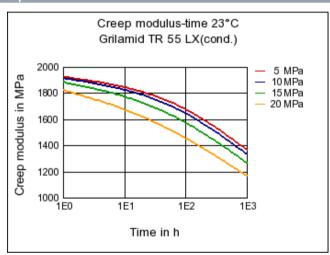
## Stress-strain (isochronous) 23°C



## Creep curve °C



## Creep modulus-time 23°C



## Characteristics

#### Processing

Injection Molding

# Delivery form

Granules

## Special Characteristics

Transparent

## Regional Availability

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

## Electricals & Electronics

Electrical appliances, Electrical equipment, Cables & Tubes, Energy distribution, Lighting, Mobile phones and other portable devices

#### Industry & Consumer goods

Housewares, Hydraulics & Pneumatics, Mechanical Engineering, Medical devices, Power transmission, Sanitary, water and gas supply, Sports & Leisure, Tools & Accessories

#### Optics

Optical components, Sunglasses, Spectacle frames

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The values are intended to serve as an aid in preselecting materials and for an overview of the EMS-GRIVORY product range. The information contained in this publication is based on our present knowledge and experience. The given figures and data are guidance values and do not represent binding material specifications. No warranties of any kind, either express or implied, including warranties of merchantability or fitness for a particular purpose, are given regarding products, design, data and information. The customer is not released from his obligation to investigate the products fitness and the suitability for the intended application, compliance with legal requirements and intellectual property rights. We reserve the right to change the information at any time and without prior notice. The information in this publication is not to be considered a contractual obligation and anyliability whatsoever is expressly declined. For further questions about our products please contact our experts.

# **Grilamid TR 55 LX** PA12/MACMI

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

#### Product Attributes

Burning Behaviour

Improved alcohol resistance

UL V2

## Automotive

## Water contact

Automotive electr. and electronics, lighting, Cooling and climate control, Fuel systems, Powertrain and Chassis, Interior

**NSF 61** 

#### **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)
- U 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)

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- U 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)