

## Grilamid L 20 HL black 9563

PA12

EMS-GRIVORY | a unit of EMS-CHEMIE AG

### Product Texts

Product designation according to ISO 1874:

PA12, EHL, 18-010

| 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>5 / 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 / 50</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>- / 7</b>           | kJ/m <sup>2</sup> | ISO 179/1eA   |
| Charpy notched impact strength (-30°C) | <b>- / 6</b>           | kJ/m <sup>2</sup> | ISO 179/1eA   |

| Mechanical properties (TPE) | dry / cond    | Unit | Test Standard |
|-----------------------------|---------------|------|---------------|
| Shore D hardness (15s)      | <b>- / 70</b> | -    | ISO 868       |

| Thermal properties                           | dry / cond      | Unit  | Test Standard   |
|----------------------------------------------|-----------------|-------|-----------------|
| Melting temperature (10°C/min)               | <b>178 / -</b>  | °C    | ISO 11357-1/-3  |
| Temp. of deflection under load (1.80 MPa)    | <b>45 / -</b>   | °C    | ISO 75-1/-2     |
| Temp. of deflection under load (0.45 MPa)    | <b>115 / -</b>  | °C    | ISO 75-1/-2     |
| Coeff. of linear therm. expansion (parallel) | <b>120 / -</b>  | E-6/K | ISO 11359-1/-2  |
| Coeff. of linear therm. expansion (normal)   | <b>140 / -</b>  | E-6/K | ISO 11359-1/-2  |
| Burning Behav. at thickness h                | <b>HB / -</b>   | class | IEC 60695-11-10 |
| Thickness tested                             | <b>0.8 / -</b>  | mm    | IEC 60695-11-10 |
| Max. usage temperature (long term)           | <b>90 - 110</b> | °C    | ISO 2578        |
| Max. usage temperature (short term)          | <b>150</b>      | °C    | EMS             |

| Electrical properties      | dry / cond      | Unit  | Test Standard |
|----------------------------|-----------------|-------|---------------|
| Volume resistivity         | <b>- / 1E11</b> | Ohm*m | IEC 60093     |
| Surface resistivity        | <b>- / 1E12</b> | Ohm   | IEC 60093     |
| Electric strength          | <b>- / 32</b>   | kV/mm | IEC 60243-1   |
| Comparative tracking index | <b>- / 550</b>  | -     | IEC 60112     |

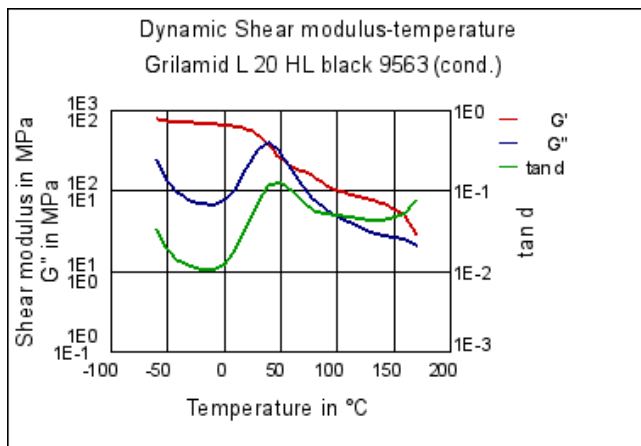
| Other properties    | dry / cond      | Unit              | Test Standard  |
|---------------------|-----------------|-------------------|----------------|
| Water absorption    | <b>1.5 / -</b>  | %                 | Sim. to ISO 62 |
| Humidity absorption | <b>0.7 / -</b>  | %                 | Sim.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

| Rheo/Phys properties         | dry / cond     | Unit | Test Standard   |
|------------------------------|----------------|------|-----------------|
| Molding shrinkage (parallel) | <b>0.8 / -</b> | %    | ISO 294-4, 2577 |
| Molding shrinkage (normal)   | <b>0.8 / -</b> | %    | ISO 294-4, 2577 |

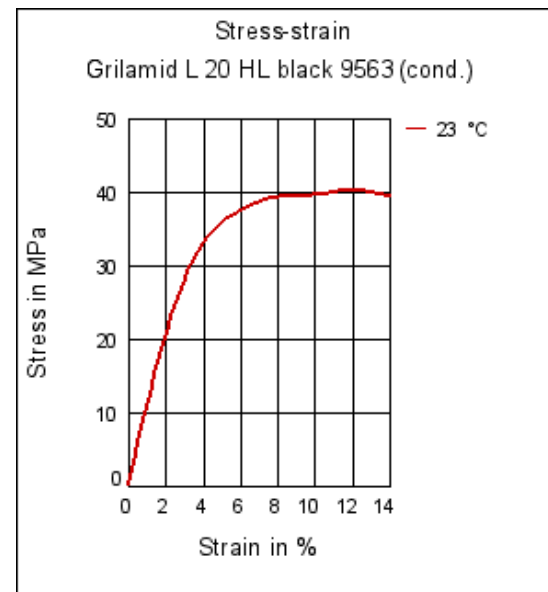
### Diagrams



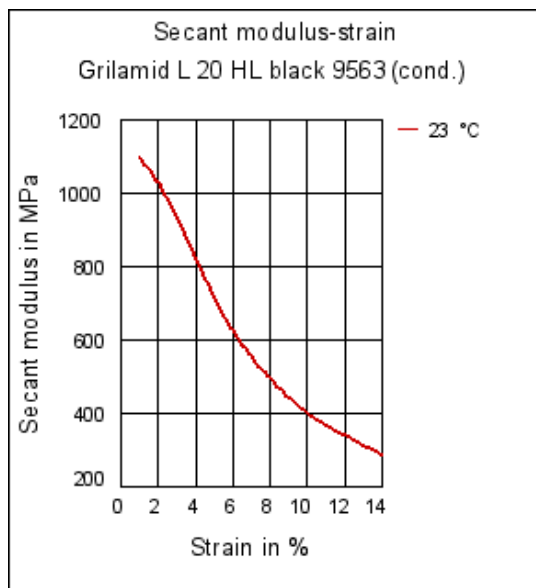
#### Dynamic Shear modulus-temperature



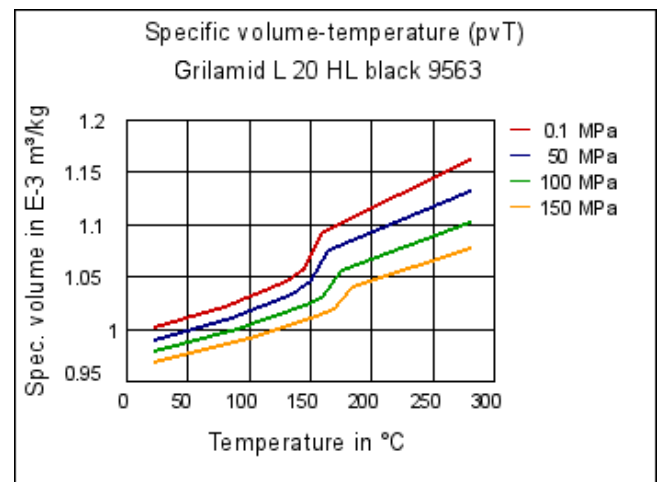
#### Stress-strain



#### Secant modulus-strain



#### Specific volume-temperature (pvT)



#### Characteristics

##### Processing

Other Extrusion

##### Delivery form

Granules

##### Special Characteristics

Light stabilized or stable to light, Improved UV resistance (outdoor

##### Automotive

Air intake sytems, Compressed air systems, Hydraulic systems, Fuel systems, Powertrain and Chassis

##### Electricals & Electronics

Cables & Tubes



use), Improved heat resistance

#### Industry & Consumer goods

#### Regional Availability

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

Hydraulics & Pneumatics, Mechanical Engineering, Tools &  
Accessories

#### 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)

