

## Rilsan® BMNO TLD

PA11

### Rilsan® BMNO TLD (PA11, MHLR,12-010) resin

**Rilsan® BMNO TLD resin** is a polyamide produced from a renewable source.

This natural grade is designed for injection molding.

This grade is also available in black as Rilsan® BMN BLACK TLD resin

#### Rheological properties

	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	<b>36.5 / *</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>235 / *</b>	°C	-
Load	<b>2.16 / *</b>	kg	-
Molding shrinkage, parallel	<b>0.4 / *</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>0.8 / *</b>	%	ISO 294-4, 2577

#### Mechanical properties

	dry / cond	Unit	Test Standard
Tensile Modulus	<b>- / 1320</b>	MPa	ISO 527-1/-2
Yield stress	<b>- / 41</b>	MPa	ISO 527-1/-2
Yield strain	<b>- / 5</b>	%	ISO 527-1/-2
Nominal strain at break	<b>- / &gt;50</b>	%	ISO 527-1/-2
Charpy impact strength, +23°C	<b>- / N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	<b>- / N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, +23°C	<b>- / 9</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	<b>- / 4</b>	kJ/m <sup>2</sup>	ISO 179/1eA

#### Thermal properties

	dry / cond	Unit	Test Standard
Melting temperature, 10°C/min	<b>189 / *</b>	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.80 MPa	<b>50 / *</b>	°C	ISO 75-1/-2
Temp. of deflection under load, 0.45 MPa	<b>145 / *</b>	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 50N	<b>160 / *</b>	°C	ISO 306
Coeff. of linear therm. expansion, parallel	<b>85 / *</b>	E-6/K	ISO 11359-1/-2
Burning Behav. at 1.5 mm nom. thickn.	<b>V-2 / *</b>	class	IEC 60695-11-10
Thickness tested	<b>1.6 / *</b>	mm	-
Burning Behav. at thickness h	<b>V-2 / *</b>	class	IEC 60695-11-10
Thickness tested	<b>3.2 / *</b>	mm	-
Oxygen index	<b>25 / *</b>	%	ISO 4589-1/-2

#### Electrical properties

	dry / cond	Unit	Test Standard
Relative permittivity, 100Hz	<b>4 / -</b>	-	IEC 60250

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Relative permittivity, 1MHz	<b>3 / -</b>	-	IEC 60250
Dissipation factor, 100Hz	<b>598 / -</b>	E-4	IEC 60250
Dissipation factor, 1MHz	<b>262 / -</b>	E-4	IEC 60250
Volume resistivity	<b>- / 1E12</b>	Ohm*m	IEC 60093
Surface resistivity	<b>* / 1E14</b>	Ohm	IEC 60093
Electric strength	<b>- / 30</b>	kV/mm	IEC 60243-1
Comparative tracking index	<b>* / 600</b>	-	IEC 60112

### Other properties

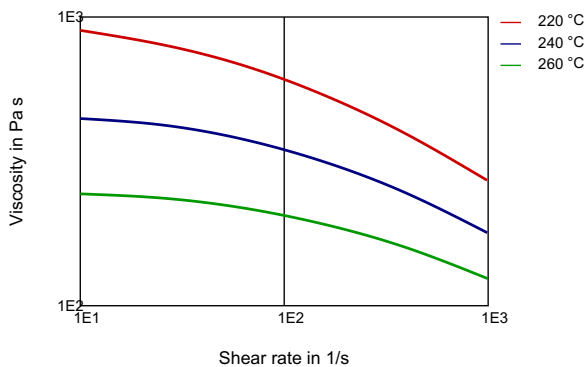
	<b>dry / cond</b>	<b>Unit</b>	<b>Test Standard</b>
Water absorption	<b>1.9 / *</b>	%	Sim. to ISO 62
Humidity absorption	<b>0.8 / *</b>	%	Sim. to ISO 62
Density	<b>1030 / 1030</b>	kg/m <sup>3</sup>	ISO 1183

### Test specimen production

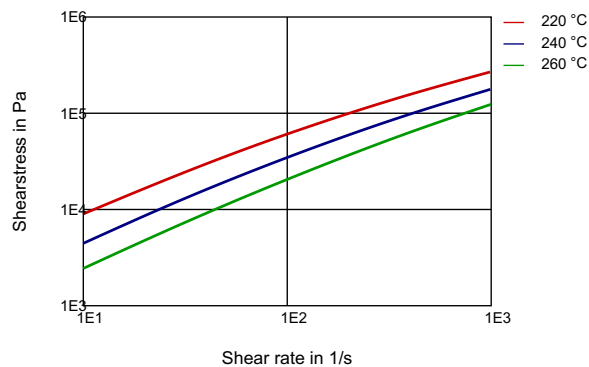
	<b>Value</b>	<b>Unit</b>	<b>Test Standard</b>
Injection Molding, melt temperature	<b>260</b>	°C	ISO 294
Injection Molding, mold temperature	<b>50</b>	°C	ISO 10724
Injection Molding, pressure at hold	<b>16</b>	MPa	ISO 294

## Diagrams

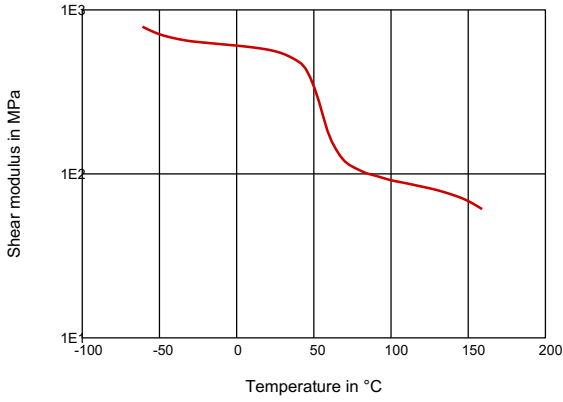
### Viscosity-shear rate



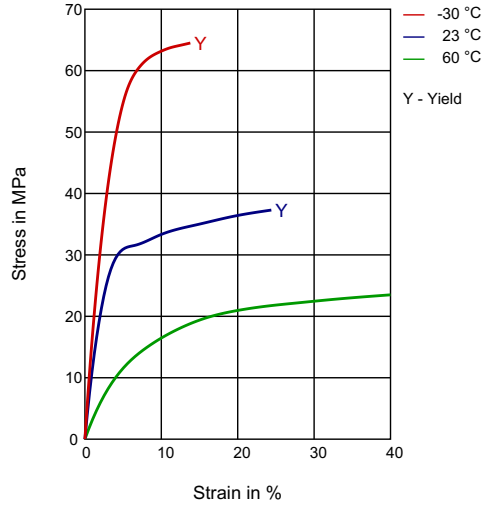
### Shearstress-shear rate



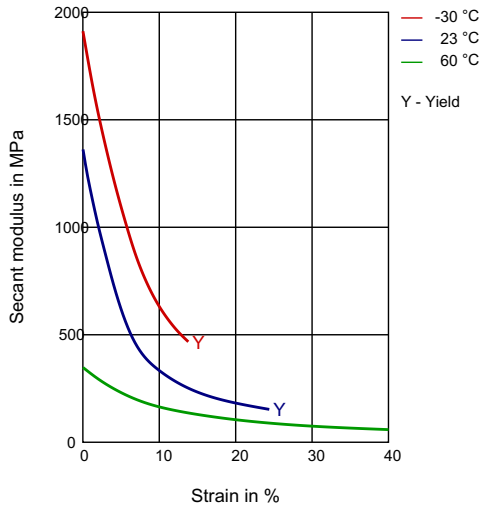
Dynamic Shear modulus-temperature



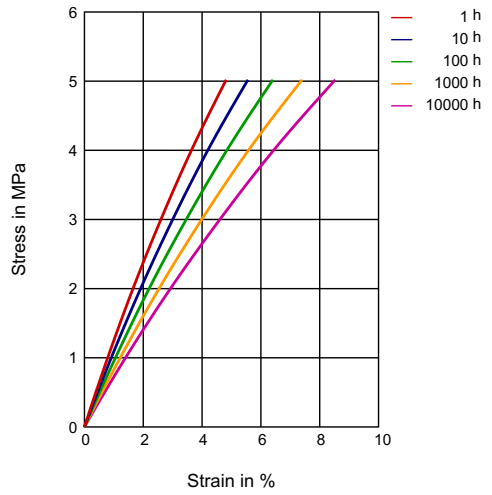
Stress-strain



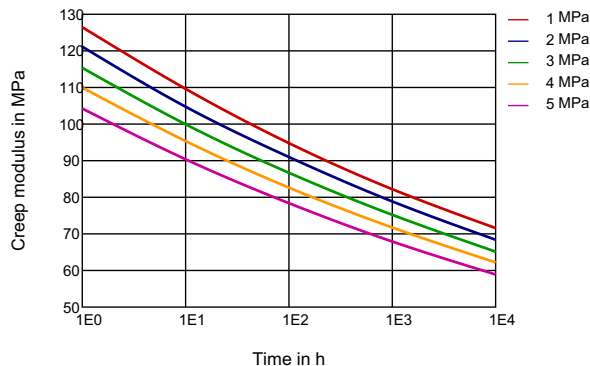
Secant modulus-strain



Stress-strain (isochronous) 120°C



**Creep modulus-time 120°C**



**Characteristics**

**Processing**

Injection Molding

**Delivery form**

Pellets

**Additives**

Release agent

**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**

- ✓ Methanol (23°C)
- ✓ Ethanol (23°C)

**Hydrocarbons**

- ✓ n-Hexane (23°C)
- ✓ Toluene (23°C)

**Ketones**

- ✓ Acetone (23°C)

**Special Characteristics**

Light stabilized or stable to light, U.V. stabilized or stable to weather, Heat stabilized or stable to heat

**Regional Availability**

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

**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)
- ✓ 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)