

## Rilsan® BESVO A MED

PA11

ARKEMA

PA11, E, 22-010

**Rilsan® BESVO A MED resin** is a polyamide 11 produced from a renewable source. This natural grade, dedicated to extrusion, contains a negligible amount of oligomers. **Rilsan® BESVO A MED resin** offers the highest quality and it is specially designed to meet the stringent requirements of the medical applications such as minimally invasive devices.

Upon request letters regarding USP Class VI compliance can be provided.

### Main applications:

- Nutritional bags
- Catheters

### Packaging:

This grade is delivered dried in sealed packaging (25 kg bags) ready to be processed.

### Shelf Life:

Two years from the delivery. For any use above this limit, please refer to our technical services.

| Rheological properties      | dry / cond | Unit                   | Test Standard   |
|-----------------------------|------------|------------------------|-----------------|
| <b>ISO Data</b>             |            |                        |                 |
| Melt volume-flow rate, MVR  | 6 / *      | cm <sup>3</sup> /10min | ISO 1133        |
| Temperature                 | 235 / *    | °C                     | -               |
| Load                        | 10 / *     | kg                     | -               |
| Molding shrinkage, parallel | 1.1 / *    | %                      | ISO 294-4, 2577 |
| Molding shrinkage, normal   | 1.1 / *    | %                      | ISO 294-4, 2577 |

| Mechanical Properties                   | dry / cond | Unit              | Test Standard |
|-----------------------------------------|------------|-------------------|---------------|
| <b>ISO Data</b>                         |            |                   |               |
| Tensile Modulus                         | - / 1180   | MPa               | ISO 527       |
| Yield stress                            | - / 36     | MPa               | ISO 527       |
| Yield strain                            | - / 5      | %                 | ISO 527       |
| Nominal strain at break                 | - / >50    | %                 | ISO 527       |
| Notched Impact Strength (Charpy), +23°C | - / 15     | kJ/m <sup>2</sup> | ISO 179/1eA   |
| Notched Impact Strength (Charpy), -30°C | - / 13     | kJ/m <sup>2</sup> | ISO 179/1eA   |
| Shore Hardness D (15s)                  | 71 / -     | -                 | ISO 868       |

| Thermal Properties             | dry / cond | Unit | Test Standard  |
|--------------------------------|------------|------|----------------|
| <b>ISO Data</b>                |            |      |                |
| Melting Temperature (10°C/min) | 186 / *    | °C   | ISO 11357-1/-3 |
| Oxygen index                   | 25 / *     | %    | ISO 4589-1/-2  |

| Electrical Properties | dry / cond | Unit  | Test Standard |
|-----------------------|------------|-------|---------------|
| <b>ISO Data</b>       |            |       |               |
| Electric Strength     | - / 30     | kV/mm | IEC 60243-1   |

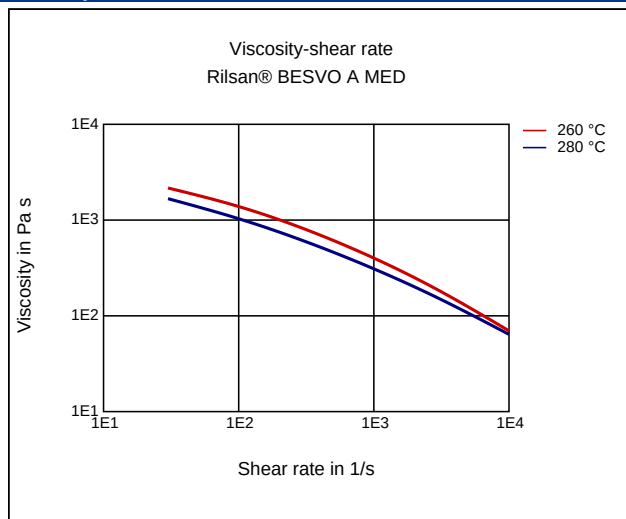
| Other Properties        | dry / cond  | Unit              | Test Standard  |
|-------------------------|-------------|-------------------|----------------|
| <b>ISO Data</b>         |             |                   |                |
| Water Absorption        | 1.9 / *     | %                 | Sim. to ISO 62 |
| Density                 | 1030 / 1030 | kg/m <sup>3</sup> | ISO 1183       |
| Biobased carbon content | 100         | %                 | -              |

## Rilsan® BESVO A MED PA11

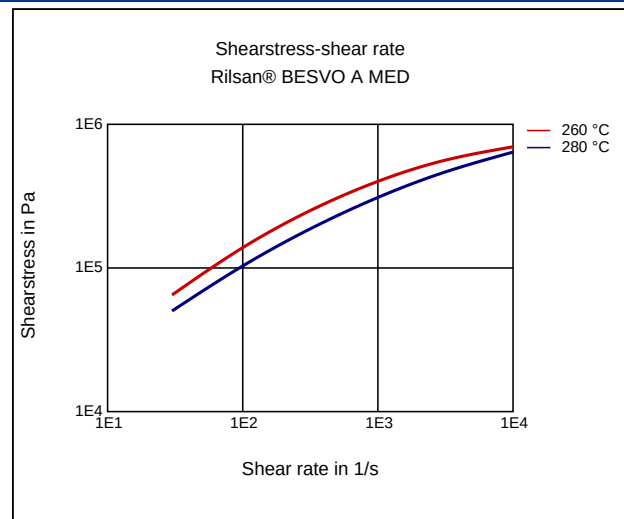
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### Diagrams

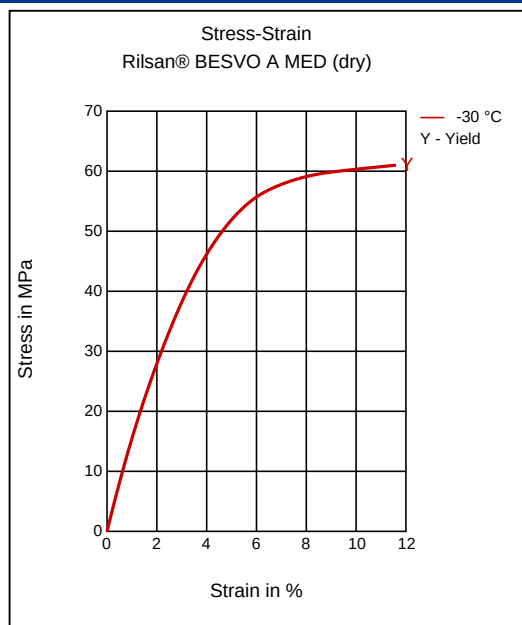
#### Viscosity-shear rate



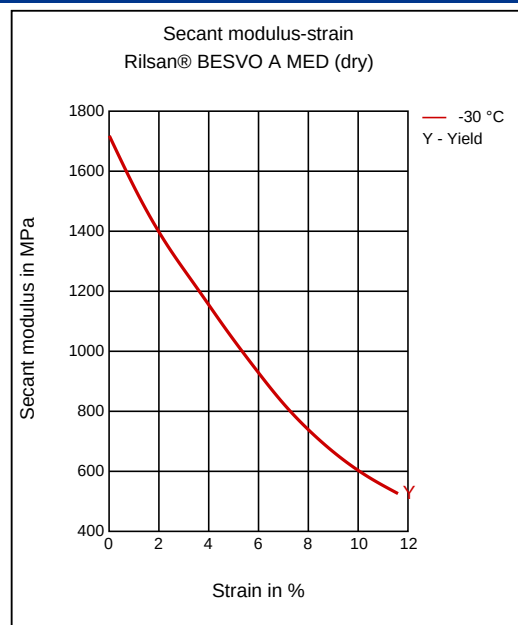
#### Shearstress-shear rate



#### Stress-strain



#### Secant modulus-strain



### Characteristics

#### Processing

Injection Molding, Film Extrusion, Profile Extrusion, Other Extrusion

#### Delivery form

Pellets

#### Certifications

Contains renewable resources, Medical, US Pharmacopeia Class VI Approved

#### Applications

Medical

### Other Extrusion

#### Processing conditions:

- Typical melt temperature (Min / Recommended / Max) : 230°C / 250°C / 280°C.

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- Drying time and temperature (only necessary for bags opened for more than two hours) : 4-6 hours at 65-80°C.

**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)

**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)
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### 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)
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