

Product Information

# VESTAMID® E62-S3

## HEAT- AND LIGHT-STABILIZED COMPOUND BASED ON POLYAMIDE 12 ELASTOMER FOR MOLDING OF SPORT SHOE SOLES

**VESTAMID® E62-S3** is a PA 12 elastomer consisting of PA 12 segments and softening segments. The material is free of volatile or migrating plasticizer.

The VESTAMID® E represent thermoplastic elastomers generically characterized as polyether block copolyamides (PEBA) consisting of PA 12 and polyether segments.

VESTAMID® E62-S3 is especially developed for sport shoe soles. It has good impact strength at low temperatures.

VESTAMID® E62-S3 is supplied as spherical pellets in moisture-proof packaging, ready for processing.

The process temperatures should be within a range of 190°C – 230°C.

Pigmentation may affect values.

Inside the original and undamaged packaging, the product has a shelf life of at least 2 years when stored in dry rooms at temperatures not exceeding 30°C.

### Key Features

#### Industrial Sector

Automotive and Mobility, Sustainable, Industry and Engineering, Sports and Lifestyle

#### Sustainability

Sustainable electricity

#### Processing

Injection molding, Extrusion

#### Delivery form

Pellets, Granules

#### Optics

Translucent

#### Resistance to

Heat (thermal stability), Hydrolysis / hot water, UV / light / weathering, Wear / abrasion, Fatigue resistance, Oil / fuels

#### Electrical

Insulating

#### Conformity

Automotive

#### Additives

Unfilled

| LCA-values                                      | dry                             | Unit                      | Test Standard    |
|---|---------------------------------|---------------------------|------------------|
| LCA name of certificate                         | <a href="#">VESTAMID® E mix</a> | -                         | ISO 14040, 14044 |
| LCA certifier                                   | <a href="#">TÜV Rheinland</a>   | -                         | ISO 14040, 14044 |
| Blue water consumption                          | <b>14.2</b>                     | kg                        | ISO 14040, 14044 |
| Global Warming Potential incl. bio. C incl. LUC | <b>6.5</b>                      | kg CO <sub>2</sub> eq./kg | ISO 14040, 14044 |
| Global Warming Potential excl. bio. C incl. LUC | <b>6.5</b>                      | kg CO <sub>2</sub> eq./kg | ISO 14040, 14044 |
| Land use (ReCiPe 2016)                          | <b>0</b>                        | Annual crop eq. y         | ISO 14040, 14044 |
| GWP savings as compared to 2023 reference       | <b>-1.6</b>                     | kg CO <sub>2</sub> eq./kg | ISO 14040, 14044 |

| Mechanical properties ISO                   | dry / cond       | Unit              | Test Standard |
|---|------------------|-------------------|---------------|
| Tensile modulus                             | <b>370 / 365</b> | MPa               | ISO 527       |
| Tensile strength                            | <b>23 / 24</b>   | MPa               | ISO 527       |
| Yield stress                                | <b>23 / 24</b>   | MPa               | ISO 527       |
| Yield strain                                | <b>30 / 26</b>   | %                 | ISO 527       |
| Stress at 50% strain                        | <b>23 / 23</b>   | MPa               | ISO 527       |
| Stress at break                             | <b>40 / 40</b>   | MPa               | ISO 527       |
| Nominal strain at break, tB                 | <b>300 / 300</b> | %                 | ISO 527       |
| Typical for the mat. nom. strain at br., tB | <b>200</b>       | %                 | ISO 527       |
| 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>120 / 112</b> | kJ/m <sup>2</sup> | ISO 179/1eA   |
| Type of failure                             | <b>P / P</b>     | -                 | -             |
| Charpy notched impact strength, -30°C       | <b>8 / 11</b>    | kJ/m <sup>2</sup> | ISO 179/1eA   |
| Type of failure                             | <b>C / C</b>     | -                 | -             |
| Tensile-impact strength, notched, atN +23°C | <b>230 / -</b>   | kJ/m <sup>2</sup> | ISO 8256/1    |
| Flexural modulus, 23°C                      | <b>350 / 345</b> | MPa               | ISO 178       |
| Flexural stress at conv. deflection, 23°C   | <b>13 / 13</b>   | MPa               | ISO 178       |
| Flexural strength, 23°C                     | <b>19 / 20</b>   | MPa               | ISO 178       |

|  |                    |               |           |
|--|--------------------|---------------|-----------|
| Flexural strain at flexural strength, 23°C | <b>9 / 9</b>       | %             | ISO 178   |
| Flexural stress at break, 23°C             | <b>N / N</b>       | MPa           | ISO 178   |
| Flexural strain at break, 23°C             | <b>N / N</b>       | %             | ISO 178   |
| Taber Abrasion Resistance, S33, 2x 500g    | <b>&lt; 15 / -</b> | mg/100 cycles | DIN 53754 |

| <b>Mechanical properties (TPE)</b> | <b>dry / cond</b> | <b>Unit</b> | <b>Test Standard</b> |
|------------------------------------|-------------------|-------------|----------------------|
| Stress at 5% elongation            | <b>15.3 / -</b>   | MPa         | ISO 527              |
| Stress at 10% elongation           | <b>20.2 / -</b>   | MPa         | ISO 527              |
| Stress at 20% elongation           | <b>22.7 / -</b>   | MPa         | ISO 527              |
| Stress at 50% elongation           | <b>23 / -</b>     | MPa         | ISO 527              |
| Stress at 100% elongation          | <b>27.3 / -</b>   | MPa         | -                    |
| Strain at break TPE                | <b>217 / -</b>    | %           | ISO 527              |
| Stress at break TPE                | <b>43.2 / -</b>   | MPa         | ISO 527              |
| Compression set at 70 °C, 24h      | <b>48 / -</b>     | %           | ISO 815              |
| Compression set at 100 °C, 24h     | <b>85 / -</b>     | %           | ISO 815              |
| Compression set at 23 °C, 24h      | <b>34 / -</b>     | %           | -                    |

| <b>Thermal properties</b>                                  | <b>dry / cond</b> | <b>Unit</b> | <b>Test Standard</b> |
|--|-------------------|-------------|----------------------|
| Melting temperature  | <b>172 / *</b>    | °C          | ISO 11357-1/-3       |
| Glass transition temperature, DSC                          | <b>10 / *</b>     | °C          | ISO 11357-1/-2       |
| Temp. of deflection under load A, 1.80 MPa                 | <b>45 / *</b>     | °C          | ISO 75-1/-2          |
| Temp. of deflection under load B, 0.45 MPa                 | <b>100 / *</b>    | °C          | ISO 75-1/-2          |
| Vicat softening temperature A, 10 N, 50 K/h                | <b>165 / *</b>    | °C          | ISO 306              |
| Vicat softening temperature B, 50 N, 50 K/h                | <b>110 / *</b>    | °C          | ISO 306              |
| Coeff. of linear therm. expansion, 23°C to 55 °C, parallel | <b>200 / *</b>    | E-6/K       | ISO 11359-1/-2       |
| Coeff. of linear therm. expansion, 23°C to 55 °C, normal   | <b>200 / *</b>    | E-6/K       | ISO 11359-1/-2       |
| Melting Temperature  | <b>172</b>        | °C          | ASTM D 3418          |

| Physical properties                          | dry / cond            | Unit              | Test Standard  |
|--|-----------------------|-------------------|----------------|
| Density                                      | 1030 / -              | kg/m <sup>3</sup> | ISO 1183       |
| Water absorption                             | 1.1 / *               | %                 | Sim. to ISO 62 |
| Humidity absorption                          | 0.5 / *               | %                 | Sim. to ISO 62 |
| Shore D hardness                             | 62 <sup>[b]</sup> / - | -                 | ISO 7619-1     |
| Compression Set under constant strain, 23°C  | 34 / -                | %                 | ISO 815        |
| Compression Set under constant strain, 70°C  | 48 / -                | %                 | ISO 815        |
| Compression Set under constant strain, 100°C | 85 / -                | %                 | ISO 815        |
| Density                                      | 1030                  | kg/m <sup>3</sup> | ASTM D 792     |

b: 3 seconds

| Burning Behav.                        | dry / cond | Unit  | Test Standard   |
|---------------------------------------|------------|-------|-----------------|
| Burning behav. at 1.5 mm nom. thickn. | HB / *     | class | IEC 60695-11-10 |
| Thickness tested                      | 1.6 / *    | mm    | -               |

| Electrical properties                       | dry / cond   | Unit           | Test Standard |
|---|--------------|----------------|---------------|
| Volume resistivity, V                       | 2E10 / 2.5E9 | Ohm*m          | IEC 62631-3-1 |
| Surface resistivity, C, circular electrodes | - / 3E13     | Ohm per square | IEC 62631-3-2 |
| Relative permittivity, 100Hz                | 9 / -        | -              | IEC 62631-2-1 |
| Relative permittivity, 1MHz                 | 4 / -        | -              | IEC 62631-2-1 |
| Dissipation factor, 100Hz                   | 1000 / -     | E-4            | IEC 62631-2-1 |
| Dissipation factor, 1MHz                    | 1200 / -     | E-4            | IEC 62631-2-1 |
| Dielectric strength, AC, S20/S20, t. 1 mm   | 39 / 35      | kV/mm          | IEC 60243-1   |

| Rheological properties      | dry / cond | Unit                   | Test Standard   |
|-----------------------------|------------|------------------------|-----------------|
| Melt volume-flow rate, MVR  | 20 / *     | cm <sup>3</sup> /10min | ISO 1133        |
| Temperature                 | 240 / *    | °C                     | -               |
| Load                        | 2.16 / *   | kg                     | -               |
| Molding shrinkage, parallel | 0.8 / *    | %                      | ISO 294-4, 2577 |

VESTAMID®

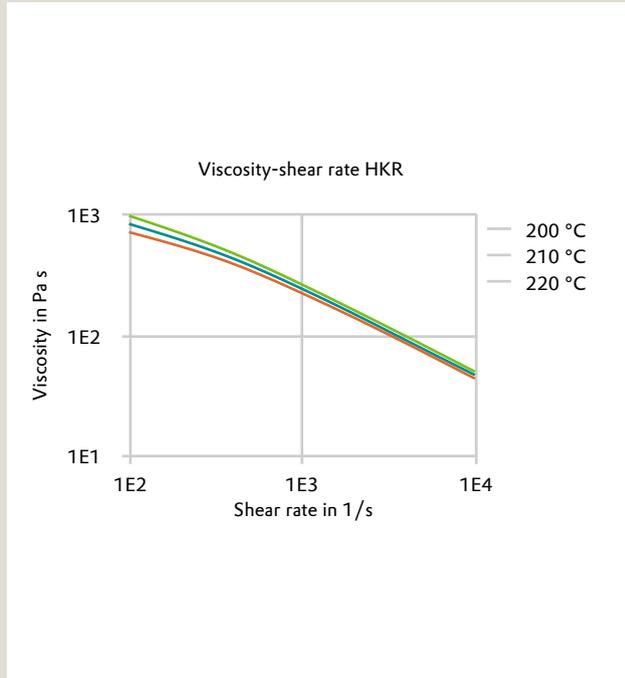
|                           |                |    |                 |
|---------------------------|----------------|----|-----------------|
| Molding shrinkage, normal | <b>1.4 / *</b> | %  | ISO 294-4, 2577 |
| Mold temperature          | <b>35 / *</b>  | °C | -               |
| Melt temperature          | <b>200 / *</b> | °C | -               |

| Polymer analytics | dry / cond     | Unit               | Test Standard       |
|-------------------|----------------|--------------------|---------------------|
| Viscosity number  | <b>190 / *</b> | cm <sup>3</sup> /g | ISO 307, 1157, 1628 |

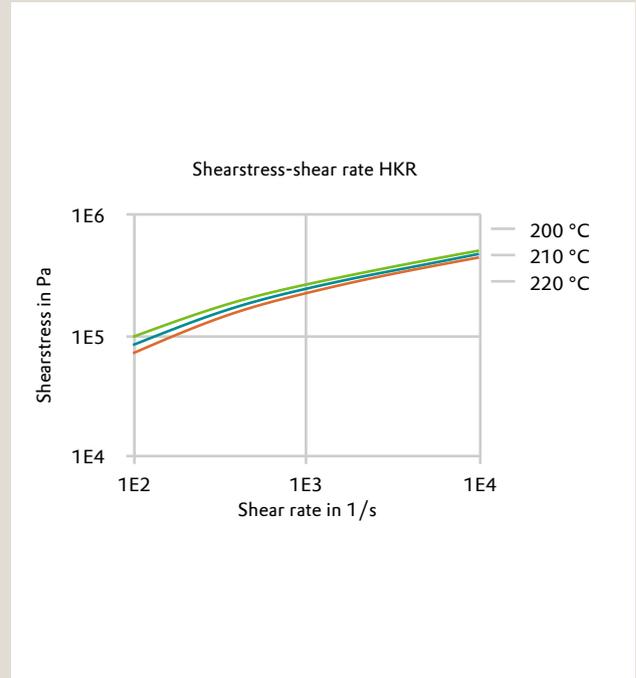
| Test specimen production              | dry        | Unit | Test Standard |
|---------------------------------------|------------|------|---------------|
| Injection Molding, melt temperature   | <b>220</b> | °C   | ISO 294       |
| Injection Molding, mold temperature   | <b>35</b>  | °C   | ISO 294       |
| Injection Molding, injection velocity | <b>200</b> | mm/s | ISO 294       |
| Injection Molding, pressure at hold   | <b>70</b>  | MPa  | ISO 294       |

Diagrams

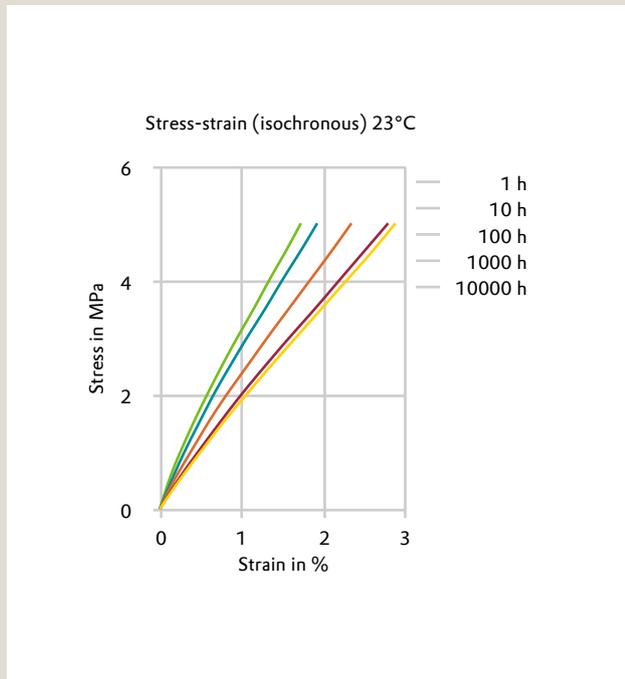
Viscosity-shear rate HKR



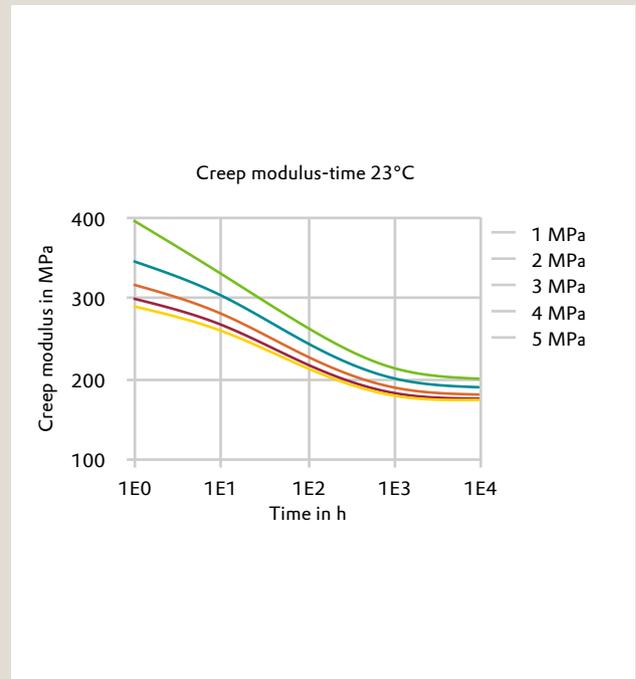
Shearstress-shear rate HKR



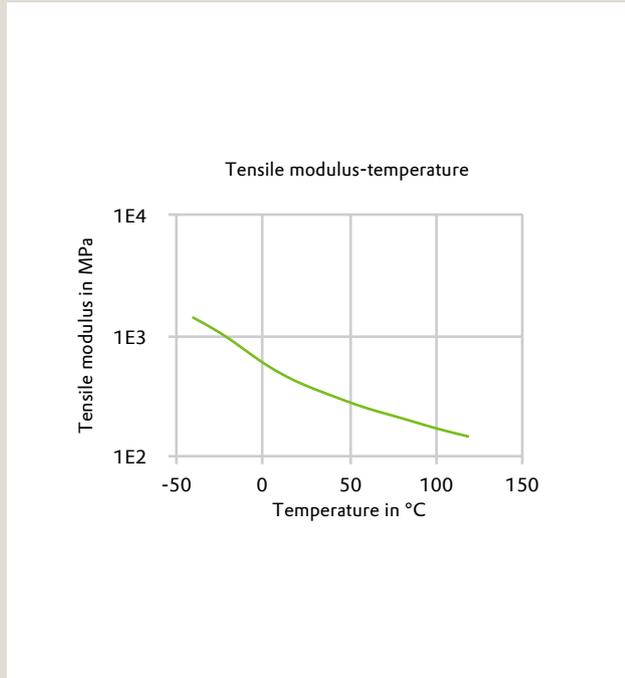
Stress-strain (isochronous) 23°C



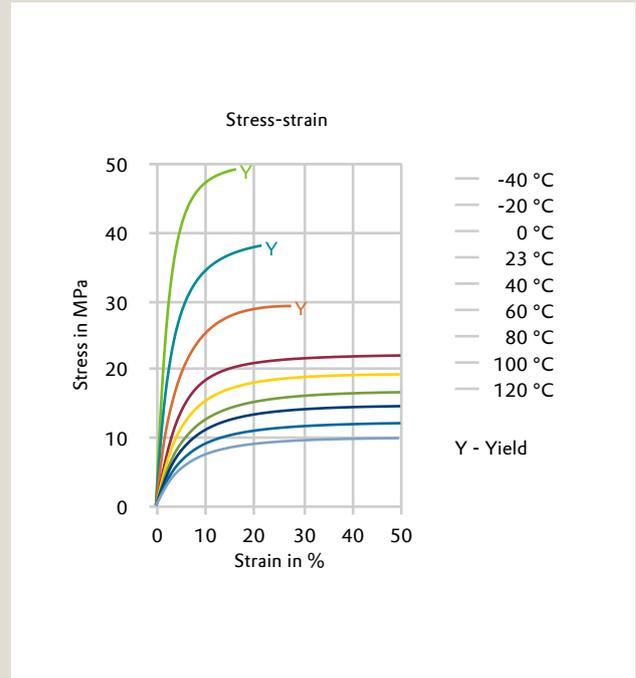
Creep modulus-time 23°C



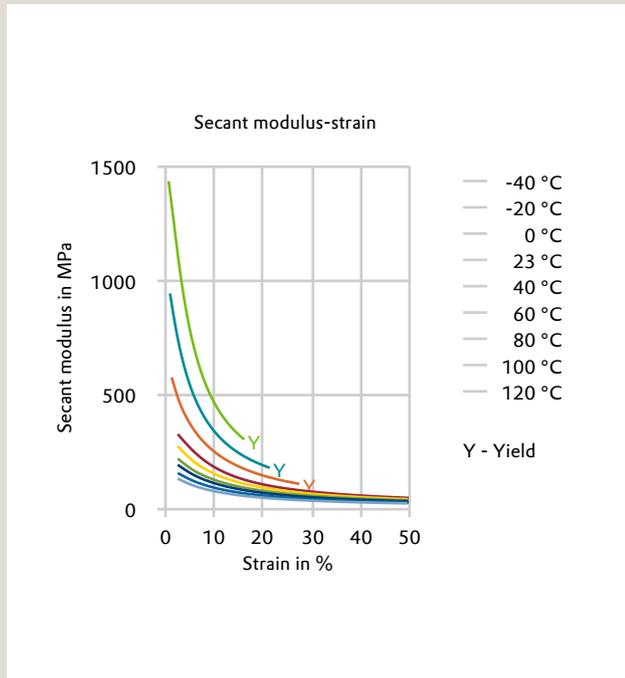
Tensile modulus-temperature



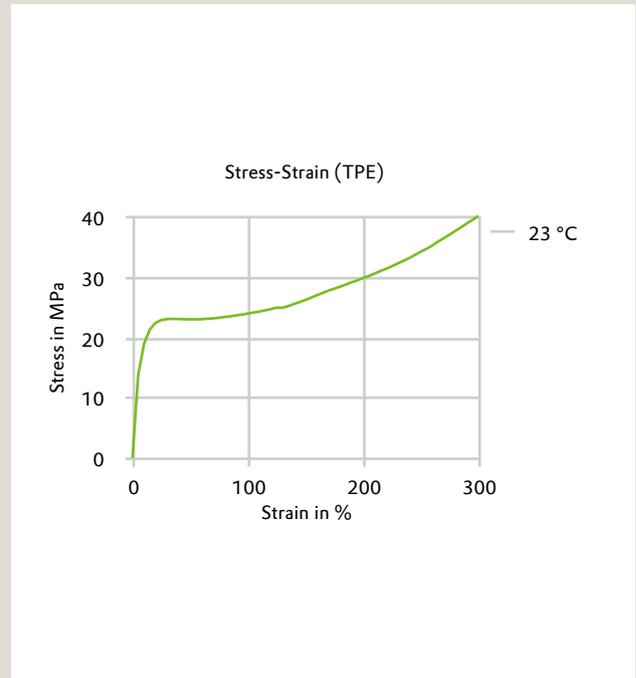
Stress-strain



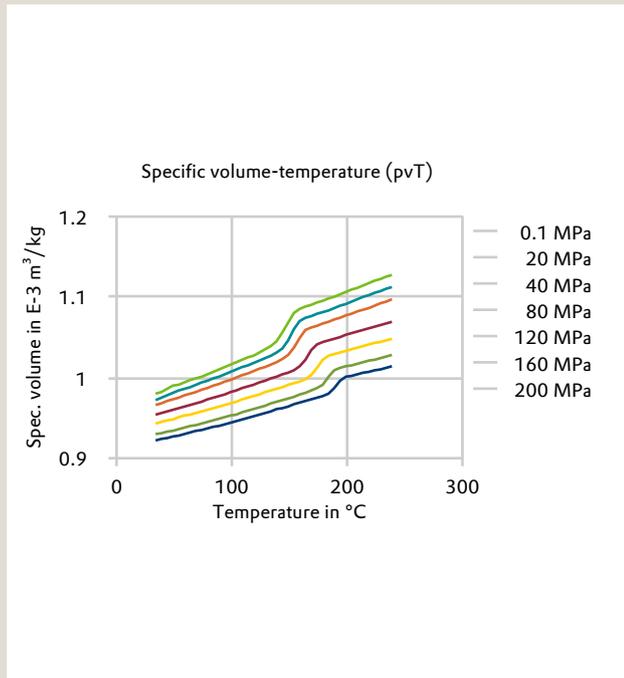
Secant modulus-strain



Stress-Strain (TPE)



**Specific volume-temperature (pvT)**



**Characteristics**

**Processing**

Profile extrusion

**Color**

Natural color

**Special Characteristics**

Light-stabilized, U.V. stabilized, High heat resistant

**Additives**

Light stabilizer, Heat stabilizer

**Chemical Media Resistance**

**Acids**

- ✓ Acetic Acid (5% by mass) (23°C)
- ✓ Citric Acid solution (10% 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)

**Salt solutions**

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

**Other**

- ✓ Ethyl Acetate (23°C)
- ✓ Hydrogen peroxide (23°C)
- ✓ Water (23°C)

| <b>Rheological calculation properties</b> | <b>dry</b> | <b>Unit</b> | <b>Test Standard</b> |
|---|------------|-------------|----------------------|
| Min. mold temperature                     | <b>15</b>  | °C          | -                    |
| Max. mold temperature                     | <b>40</b>  | °C          | -                    |
| Min. melt temperature                     | <b>200</b> | °C          | -                    |
| Max. melt temperature                     | <b>240</b> | °C          | -                    |