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# PR600

## References:

**Polyol: PR600-POLYOL-SL600000** **Isocyanate: PR600-PRA610-ISO-SL000600**

## Definition:

➔ PR600 :

Polyurethane resin for the realisation of PA, PC or filled ABS like parts with the vacuum casting process. The product shows high thermomechanical properties and excellent impact resistance. Slightly yellow transparent material, easily colourable, with good flowability in silicone moulds and a short demoulding time. REACH-compatible material complying with the following European Directives:

- 2011/65/EU - 2015/863 - 2017/2102/EU (RoHS 1 and 2)
- 2002/96/EC (WEEE)
- 2000/53/EC (ELVs)
- 2000/11/EC

## Average physical properties of the components:

| | PR600 Polyol SL 600 000 | PR600-PRA610 Iso SL 000 600 | PR600 Mix SL 600 600 |
|---|---|---|---|
| **Aspect - Colour** | Colourless transparent liquid | Yellow translucent liquid | Whitish liquid<br>Golden transparent solid |
| **Brookfield LVT viscosity (mPa.s)**<br>**According to MO-051** | 820 | 1200 | 2000 |
| **Density at 25°C**<br>**According to MO-032** | 1,09 | 1,24 | 1,19 |

## Application properties:

| | PR600 Polyol SL 600 000 | PR600-PRA610 Iso SL 000 600 | PR600 Mix SL 600 600 |
|---|---|---|---|
| **Mixing ratio by weight** | 50 | 100 | |
| **Mixing ratio by volume** | 57 | 100 | |
| **Mixing time at 25°C** | | | 2 min. |
| **Potlife on 150 g at 25°C**<br>**According to MO-062** | | | 8 min. |
| **Maximum casting thickness** | | | 8 mm |
| **Demoulding time at 70°C (on 3mm)**<br>**According to MO-116** | | | 50 – 60 min. |
| **Minimum post-curing time** | 1h at 70°C + 24h at room temperature | | |
| **Optimal curing time** | 2h at 70°C + 2h at 100°C + 24h at room temperature | | |

*The values mentioned on this document are based on tests and researches carried out in SYNTHENE's laboratory, in precise conditions. This document cannot be, in any case, considered as a specification data sheet. It is the responsibility of the users to check the suitability of the product in their own conditions, defined and tried by themselves. Synthene company disclaims any responsibility for any consequence occurred by the use of this product.*

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## Average mechanical and thermal properties of the cured material:

- **Average values obtained after post-curing: 1h at 70°C + 24 h at room temperature**

| | Standard | Unit | Values |
|---|---|---|---|
| **Hardness** | ISO 868 : 2003 | Shore D1 | 84 |
| **Flexural modulus** | ISO 178 : 2011 | MPa | 3000 |
| **Maximum flexural strength** | ISO 178 : 2011 | MPa | 111 |
| **Heat deflexion temperature (Hdt)** | ISO 75-2 : 2013 method B | °C | 75 |
| **Tensile Modulus** | ISO 527-1 : 2012 | MPa | 3100 |
| **Elongation at break** | ISO 527-1 : 2012 | % | 3 |
| **Tensile strength at break** | ISO 527-1 : 2012 | MPa | 70 |
| **Charpy impact resistance** | ISO 179-1/1eUb : 2010 | kJ/m² | 51 |

- **Average values obtained after post-curing: 2h at 70°C + 2h at 100°C + 24 h at room temperature**

| | Standard | Unit | Values |
|---|---|---|---|
| **Hardness** | ISO 868 : 2003 | Shore D1 | 84 |
| **Flexural modulus** | ISO 178 : 2011 | MPa | 2850 |
| **Maximum flexural strength** | ISO 178 : 2011 | MPa | 119 |
| **Heat deflexion temperature (Hdt)** | ISO 75-2 : 2013 method B | °C | 105 |
| **Glass transition temperature (Tg)** | ISO 6721-10 : 2015 | °C | 112 |
| **Tensile modulus** | ISO 527-1 : 2012 | MPa | 2900 |
| **Maximum tensile strength** | ISO 527-1 : 2012 | MPa | 84 |
| **Elongation at maximum strength** | ISO 527-1 : 2012 | % | 6 |
| **Elongation at break** | ISO 527-1 : 2012 | % | 11 |
| **Tensile strength at break** | ISO 527-1 : 2012 | MPa | 68 |
| **Charpy impact resistance** | ISO 179-1/1eUb : 2010 | kJ/m² | >100 (does not break) |
| | ISO 179-1 /1 fUc | kJ/m² | 80 |
| | ISO 179-1/1eAb : 2010 Notched specimen | Kj/m² | 6 |

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## Hygiene and safety for using:

Wearing appropriate safety clothes and accessories (gloves, glasses) is advised.
Work in a ventilated room.
For more information, please read the Medical and Safety Data Sheet of the material.

## Operating conditions:

### ➔ Application process in a vacuum casting machine:

1. Preheat the polyaddition silicone mould at 70°C.
2. Rehomogenise and weigh the separate components (upper cup: Polyol / lower cup: Iso), with addition of the necessary residual quantity in the upper cup. Then, put the cups inside the vacuum casting machine. If a pigment is added, it should imperatively be mixed to the polyol component. A 1 to 3% rate of the total product quantity (polyol + isocyanate) is recommended.
3. Degas the products during 10 minutes, with agitation in the lower cup (Iso).
4. Stop the agitation and pour the content of the upper cup (Polyol) into the lower cup (Iso).
5. Start the agitation and mix for at least 2 minutes.
6. Slightly release the vacuum in the chamber to a pressure of about 100 hPa (0,1bar).
7. Cast the mixture into the silicone mould until complete filling.
8. Break the vacuum back to atmospheric pressure.
9. Place the mould in an oven at 70°C.
10. Demoulding is possible after:
    - 50 - 60 minutes at 70°C, depending on the thickness of the part.

In order to obtain the mechanical properties of the material, it is necessary to realise a complete curing, demoulding time included, of:

- Minimum post-curing: 2h at 70°C + 24h at room temperature
- Optimal curing time: 2h at 70°C + 2h at 100°C + 24h at room temperature

## Packaging:

• Box of 4 kits of (1,0 kg polyol + 2 x 1,0 kg isocyanate) = 12 kg

• Box of 2 kits of (5,0 kg polyol + 2 x 5,0 kg isocyanate) = 15 kg

## Storage:

12 months in original and unopened containers, stored between 15 and 25 °C.

## Observations:

The final product colour can vary depending on its exposure to UV light, without altering its mechanical properties. Depending on the transport and storage conditions, crystallization can happen in the isocyanate component. In this case, place it in an oven at 70°C until the product is homogeneous again.

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