

PR777

References :

Polyol: PR777-POLYOL-ST777000

Isocyanate: PR7SERIES-ISO-ST000401

Definition :

→ **PR777 :**

Polyurethane resin for the realisation of PP-like or HDPE-like parts with the vacuum casting process. The product has high thermal and impact resistance properties, and a low aggressiveness to silicone moulds. Semi-rigid white and colourable material, with a great flexibility.

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 :

	PR777 Polyol ST 777 000	PR 7 Series Iso ST 000 401	PR777 Mix ST 777 401
Aspect - Colour	Amber liquid	Colourless transparent liquid	Amber liquid White solid
Brookfield LVT viscosity (mPa.s) According to MO-051	230	1200	700
Density at 25°C According to MO-032	1,10	1,16	1,13

Application properties :

	PR777 Polyol ST 777 000	PR 7 Series Iso ST 000 401	PR777 Mix ST 777 401
Mixing ratio by weight	100	100	
Mixing ratio by volume	100	95	
Mixing time at 25°C			1 min.
Potlife on 100g at 25°C According to MO-062			10 min.
Demoulding time at 70°C (On 3mm) According to MO-116			45 min.
Minimum curing time	2h 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.

Average mechanical and thermal properties of the cured material :

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

	Standard	Unit	Values PR777
Hardness	ISO 868 : 2003	Shore D1	75
Flexural modulus	ISO 178 : 2011	MPa	900
Maximum flexural strength	ISO 178 : 2011	MPa	35
Tensile modulus	ISO 527-1 : 2012	MPa	1000
Elongation at yield	ISO 527-1 : 2012	%	9
Elongation at break	ISO 527-1 : 2012	%	35
Tensile strength at yield	ISO 527-1 : 2012	MPa	34
Tensile strength at break	ISO 527-1 : 2012	MPa	32
Charpy impact resistance	ISO 179-1 : 2010 unnotched -1eU ^b	KJ/m ²	60
Heat Deflection Temperature (HDT)	ISO 75-2 : 2013 method B	°C	94
Glass transition temperature (Tg)	ISO 6721-10 : 2015	°C	>120

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

	Standard	Unit	Values PR777
Hardness	ISO 868 : 2003	Shore D1	75
Flexural modulus	ISO 178 : 2011	MPa	930
Maximum flexural strength	ISO 178 : 2011	MPa	36
Tensile modulus	ISO 527-1 : 2012	MPa	1100
Elongation at yield	ISO 527-1 : 2012	%	10
Elongation at break	ISO 527-1 : 2012	%	37
Tensile strength at yield	ISO 527-1 : 2012	MPa	35
Tensile strength at break	ISO 527-1 : 2012	MPa	36
Charpy impact resistance	ISO 179-1 : 2010 unnotched -1eU ^b	KJ/m ²	91
Heat Deflection Temperature (HDT)	ISO 75-2 : 2013 method B	°C	110
Glass transition temperature (Tg)	ISO 6721-10 : 2015	°C	>130

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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 separated components (upper cup : Iso / lower cup : Polyol), 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 (Polyol).
4. Stop the agitation and pour the content of the upper cup (Iso) into the lower cup (Polyol).
5. Start the agitation and mix for at least 1 minute.
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 :

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

→ Application process for hand casting :

1. Preheat the polyaddition silicone mould at 70°C.
2. Rehomogenise the polyol and the isocyanate, weigh them in a clean mixing cup.
3. Duly mix both components together for at least 1 minute, making sure that the mixture is homogeneous.
4. Pour the mix in a second cup without scrapping the bottom neither trying to get the residues back from the first mixing cup walls (in order to avoid problems linked to an inhomogeneous mix). Mix again with in the second cup for around 30 seconds.
5. Degas the mixture in a vacuum chamber.
6. Cast in the mould at once, to avoid the incorporation of air in the mould while casting (if possible, cast from a low point).
7. Put the mould in an oven at 70°C.
8. Demoulding is possible after :

- 45 minutes at 70°C, depending on the thickness of the part

In order to reach the mechanical properties of the material, it is necessary to realise a post-curing, demoulding time included, of :

- Minimum curing time : 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 6 kits of (1,0 kg polyol + 1,0 kg isocyanate) = 12 kg
- Box of 2 kits of (5,0 kg polyol + 5,0 kg isocyanate) = 20 kg

Storage :

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

Comment :

The final product colour can vary depending on its exposure to UV light, without altering its mechanical properties.