

PR700

References :

Polyol: PR700-POLYOL-ST109000

Isocyanate: PR7SERIES-ISO-ST000401

Definition :

→ **PR700 :**

Polyurethane resin for the realisation of ABS-like parts with the vacuum casting process. The product has high thermal and mechanical properties, good chemical and impact resistance. Black material, with a low aggressiveness to silicone moulds. Low viscosity to facilitate the casting.

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 :

	PR700 Polyol ST 109 000	PR 7 Series Iso ST 000 401	PR700 Mix ST 109 401
Aspect - Colour	Black liquid	Colourless transparent liquid	Black liquid Black solid
Brookfield LVT viscosity (mPa.s) According to MO-051	130	1200	600
Density at 25°C According to MO-032	1,13	1,15	1,14

Application properties :

	PR700 Polyol ST 109 000	PR 7 series Iso ST 000 401	PR700 Mix ST 109 401
Mixing ratio by weight	80	100	
Mixing ratio by volume	81,5	100	
Mixing time at 25°C			1 min.
Potlife on 180g at 25°C According to MO-062			6 -7 min.
Demoulding time at 70°C (on 3mm) According to MO-116			45 min.
Optimal curing time	1h at 70°C + 1h at 100°C + 2h at 120°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 : 1h at 70°C + 1h at 100°C + 2h at 120°C + 24h at room temperature**

	Standard	Unit	Values PR700
Hardness	ISO 868 : 2003	Shore D1	82
Flexural modulus	ISO 178 : 2011	MPa	1700
Maximum flexural strength	ISO 178 : 2011	MPa	70
Tensile modulus	ISO 527-1 : 2012	MPa	1800
Elongation at maximum strength	ISO 527-1 : 2012	%	13
Elongation at break	ISO 527-1 : 2012	%	16
Maximum tensile strength	ISO 527-1 : 2012	MPa	60
Tensile strength at break	ISO 527-1 : 2012	MPa	60
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	130
Glass transition temperature (T _g)	ISO 6721-10 : 2015	°C	>130

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.
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.

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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 realize a complete curing, demoulding time included, of :

- Optimal curing time : 1h at 70°C + 1h at 100°C + 2h at 120°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 bowl 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 obtain the mechanical properties of the material, it is necessary to realise a complete curing, demoulding time included, of :

- Optimal curing time : 1h at 70°C + 1h at 100°C + 2h at 120°C + 24h at room temperature

Packaging :

- Box of 2 kits of (4,0 kg polyol + 5,0 kg isocyanate) = 18 kg
- Box of 6 kit of (0,8kg polyol + 1,0 kg isocyanate) = 10,8 kg

Storage :

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