

# PR500

## References :

Polyol : PR500-POLYOL-SL 500 000

Isocyanate : PR500-ISO-SL 000 500

Fiber glass filler : SynFill G

## Definition :

### → PR500 :

Polyurethane resin for the production of vacuum casted parts with strong mechanical properties, in a short amount of time.

Good flowability, limited aggressiveness to silicone moulds.

Colorable material.

REACH compatible material meeting the requirements of the 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

### → PR500 + SynFill G :

- « SynFill G » fiberglass filler allows one to increase rigidity of the parts and some mechanical and thermal characteristics.
- Three filler rates are available in order to guarantee the best compromise between the flowability and the product performances.
- High modulus of elasticity up to 5600 MPa in traction with 25% of filler.
- Improvement of the maximum stresses in traction and flexion.

## Average physical properties of the components :

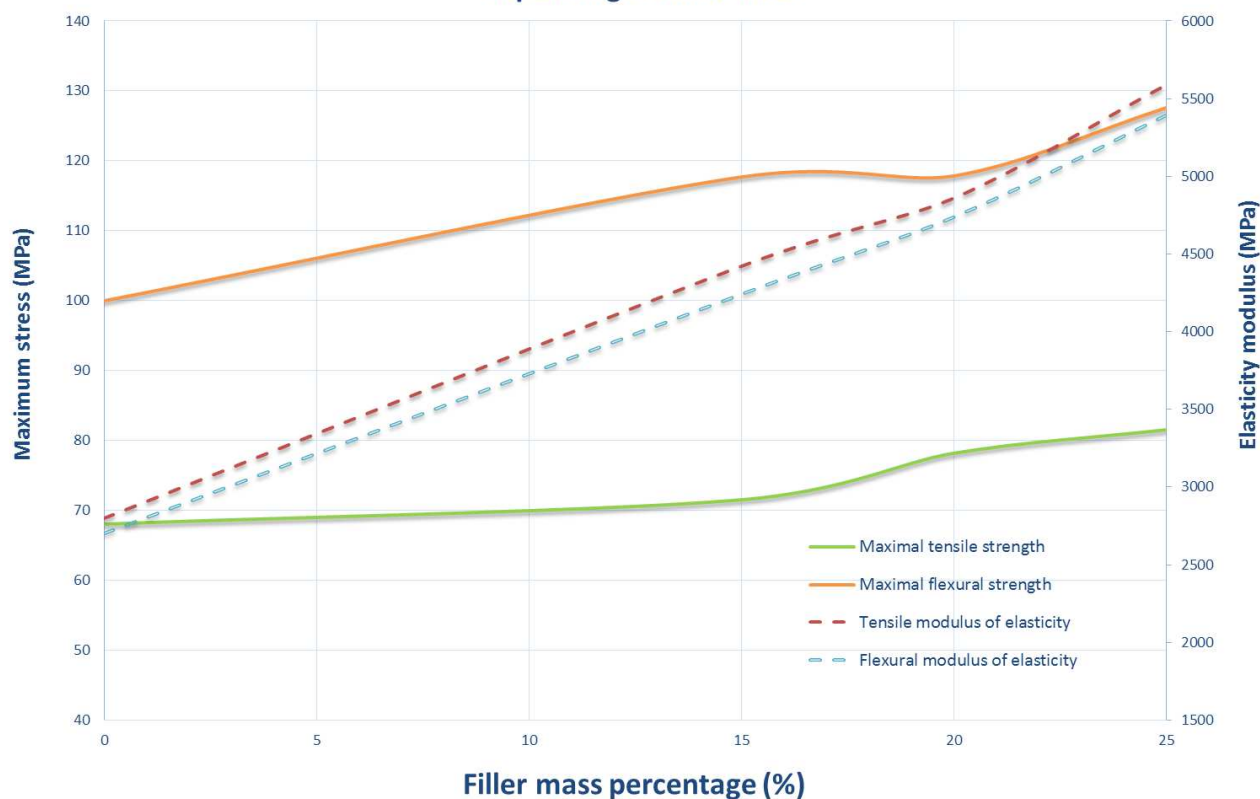
	PR500 Polyol SL 500 000	PR500 Iso SL 000 500	Mix SL 500 500	Mix +15% SynFill G	Mix + 20% SynFill G	Mix +25% SynFill G
<b>Aspect - Colour</b>	Colourless transparent liquid	Slightly yellow transparent liquid	Slightly yellow transparent liquid	Translucent liquid	Translucent liquid	Translucent liquid
<b>Brookfield LVT Viscosity (mPa.s)</b> According to MO-051	450	950	1300	2100	2800	3100
<b>Density at 25°C</b> According to MO-032	1,07	1,20	1,16	1,28	1,31	1,35

## Application properties :

	PR500 Polyol SL 500 000	PR500 Iso ST 000 500	Mix SL 500 500	Mix + 15% SynFill G	Mix + 20% SynFill G	Mix + 25% SynFill G
<b>Mixing ratio by weight</b>	40	100		21	28	35
<b>Mixing ratio by volume</b>	45	100		-	-	-
<b>Potlife on 200g at 25°C</b> According to MO-062			5 min.	5 - 6 min.	5 - 6 min.	5 - 6 min.
<b>Demoulding time at 70°C</b> According to MO-116			45 min.	45 min.	45 min.	45 min.
<b>Minimum curing time</b>	1h at 70°C + 24h at room temperature					
<b>Optimal curing time</b>	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.

**Evolution of the mechanical characteristics of the PR500 depending on filler rates**



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

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

	Test standard	Unit	Values without filler	15% SynFill G	20% SynFill G	25% SynFill G
<b>Hardness</b>	ISO 868 : 2003	Shore D1	85	86	87	88
<b>Flexural modulus</b>	ISO 178 : 2011	MPa	2700	4200	4700	5400
<b>Maximum flexural strength</b>	ISO 178 : 2011	MPa	100	118	118	128
<b>Tensile modulus</b>	ISO 527-1 : 2012	MPa	2800	4400	4900	5600
<b>Maximum tensile strength</b>	ISO 527-1 : 2012	MPa	68	72	78	82
<b>Elongation at break</b>	ISO 527-1 : 2012	%	6	2.4	2.4	2.3
<b>Charpy impact resistance</b>	ISO 179-1 : 2010 unnotched-1fU <sup>c</sup>	KJ.m <sup>2</sup>	40	28	24	23
<b>Heat deflection temperature (HDT)</b>	ISO 75-2 : 2013 Method A	°C	-	65	66	69
	ISO 75-2 : 2013 Method B	°C	70	71	74	75
<b>Transition glass Temperature (Tg)</b>	ISO 6721-10 : 2003	°C	76	-	-	-

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

	Test standard	Unit	Values without filler	15% SynFill G	20% SynFill G	25% SynFill G
Hardness	ISO 868 : 2003	Shore D1	85	88	88	89
Flexural modulus	ISO 178 : 2011	MPa	2600	4200	4500	5000
Maximum flexural strength	ISO 178 : 2011	MPa	102	135	131	139
Tensile modulus	ISO 527-1 : 2012	MPa	2800	4400	4600	5400
Maximum tensile strength	ISO 527-1 : 2012	MPa	78	84	86	93
Elongation at break	ISO 527-1 : 2012	%	10	4.5	3.5	2.3
Charpy impact resistance	ISO 179-1 : 2010 unnotched-1eU <sup>b</sup>	KJ.m-2	69	40	35	34
Heat deflection temperature (HdT)	ISO 75-2 : 2013 Method A	°C	-	94	94	97
	ISO 75-2 : 2013 Method B	°C	93	-	-	-
Transition glass Temperature (Tg)	ISO 6721-10 : 2003	°C	103	-	-	-

### Instructions before use :

**Before using the material, check that the isocyanate component does not show any sign of crystallization (presence of particles, cloudy liquid).**

*In case of crystallization, stir the bottle, slightly open the cork and place the product in an oven at 70°C, until complete decrystallization (about 2 hours for 1kg of material – one can let the product in the oven overnight in case of a bigger quantity). If the product is not clear and homogeneous after this step, place in an oven at 100°C for 1h maximum.*

**If the isocyanate is not completely clear after this second heat treatment, the product should not be used.**

*After this temperature treatment, properly close the cork back. Let the material cool down to room temperature, or at 40°C, depending on your requested casted part. Multiple exposures to temperatures above 100°C can entail an accelerated ageing of the material and modify the shelf life. It is recommended to decrystallize only the immediate need for the casting. After opening, one should place the product under an inert atmosphere (with dry air or nitrogen) before closing the packaging back.*

### Hygiene and safety instructions for using :

Wearing appropriate safety clothes and accessories (gloves, glasses and mask) is advised.

Work in a ventilated room.

For more information, please read the Medical and Safety Data Sheet of the material.

### **Application process with vacuum casting machine :**

1. Pre-heat the polyaddition silicone mould at 70°C.
2. Weigh the separated components (Upper cup : Polyol / Lower cup : Iso), without forgetting the residual quantity to add in the upper cup. If Synfill G filler is added, weigh the needed quantity in the lower cup. Then, put the cups and the mould inside the vacuum casting machine.
3. Degas for 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 approximately 60 seconds.
6. 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 partIn order to obtain the mechanical properties of the material, it is necessary to realise a complete curing, demoulding time included, of :
  - Minimum curing time : 1h at 70°C + 24h at room temperature
  - Optimal curing time : 2h at 70°C + 2h at 100°C + 24 h at room temperature

### **Packaging :**

PR500 :

- Box of 4 kits of (0,8 kg polyol + 2x1,0 kg isocyanate) = 11,2kg

Synfill G :

- Box of 30 kg
- Pail of 10 kg

### **Storage :**

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