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PR740

References :

Polyol: PR740-POLYOL-ST740000 **Isocyanate: PR7SERIES-ISO-ST000401**

Definition :

→ **PR740 :**

Polyurethane resin for the realisation of PP-like or HDPE-like parts with the vacuum casting process. The product has a high elongation at break and a low aggressiveness to silicone moulds. Semi-rigid amber 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 :

	PR740 Polyol ST 740 000	PR 7 Series Iso ST 000 401	PR740 Mix ST 740 401
Aspect - Colour	Amber liquid	Colourless transparent liquid	Amber liquid Amber solid
Brookfield LVT viscosity (mPa.s) According to MO-051	750	1200	1000
Density at 25°C According to MO-032	1,07	1,16	1,11

Application properties :

	PR740 Polyol ST 740 000	PR 7 Series Iso ST 000 401	PR740 Mix ST 740 401
Mixing ratio by weight	120	100	
Mixing ratio by volume	100	77	
Mixing time at 25°C			1 min.
Potlife on 220g at 25°C According to MO-062			7 min. 30s
Demoulding time at 70°C (on 3mm) According to MO-116			40 min.
Minimum curing time	1h at 70°C + 24h at room temperature		
Optimal curing time	4h at 70°C + 24h at room temperature		

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Average mechanical properties of the cured material :

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

	Standard	Unit	Values PR740
Hardness	ISO 868 : 2003	Shore D1	70
Flexural modulus	ISO 178 : 2011	MPa	580
Maximum flexural strength	ISO 178 : 2011	MPa	24
Tensile modulus	ISO 527-1 : 2012	MPa	650
Elongation at yield	ISO 527-1 : 2012	%	9
Elongation at break	ISO 527-1 : 2012	%	70
Tensile strength at yield	ISO 527-1 : 2012	MPa	19
Tensile strengh at break	ISO 527-1 : 2012	MPa	22
Charpy impact resistance	ISO 179-1 : 2010 notched-1eA[b]	KJ/m²	24
Heat Deflection Temperature (HDT)	ISO 75-2 : 2013 method B	°C	83
Glass transition temperature (Tg)	ISO 6721-10 : 2015	°C	102

- **Average values obtained after post-curing : 4h at 70°C + 24h at room temperature**

	Standard	Unit	Values PR740
Hardness	ISO 868 : 2003	Shore D1	70
Flexural modulus	ISO 178 : 2011	MPa	590
Maximum flexural strength	ISO 178 : 2011	MPa	25
Tensile modulus	ISO 527-1 : 2012	MPa	700
Elongation at yield	ISO 527-1 : 2012	%	21
Elongation at break	ISO 527-1 : 2012	%	50
Tensile strength at yield	ISO 527-1 : 2012	MPa	10
Tensile strengh at break	ISO 527-1 : 2012	MPa	23
Charpy impact resistance	ISO 179-1 : 2010 notched-1eA[b]	KJ/m²	21
Heat Deflection Temperature (HDT)	ISO 75-2 : 2013 method B	°C	96
Glass transition temperature (Tg)	ISO 6721-10 : 2015	°C	104

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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 :
    - 40 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 : 1h at 70°C + 24h at room temperature
- Optimal curing time : 4h at 70°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 :
    - 40 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 : 1h at 70°C + 24h at room temperature
- Optimal curing time : 4h at 70°C + 24h at room temperature

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Packaging :

- Box of 6 kits of (1,2 kg polyol + 1,0 kg isocyanate) = 13,2 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.

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