

# HPE ELASTOMER SYSTEM

## References :

Polyol: HPE 40A-POLYOL-SL240000  
Polyol: HPE 85A-POLYOL-SL285000

Isocyanate: HPE 40-85A-ISO-SL000105  
Isocyanate: HPE55D-ISO-SL000502

## Definition :

### ➔ HPE system :

High performance elastomer system designed for the production of soft technical parts. This system consists of two polyols and two isocyanates, and covers a large range of hardnesses, going from a 40 shore A elastomer to a 55 Shore D semi-rigid resin. The HPE system has a natural transparent amber colour, it can be cured at room temperature or in an oven, while maintaining a high performance level.

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

## Properties :

- Possibility to cure at room temperature (18°C-25°C)
- Possibility to cure in an oven to reach the characteristics faster
- High elongation at break
- Low exothermic reaction to facilitate mass casting
- Very high tear resistance, even on notched parts
- Good chemical resistance
- Good temperature resistance

## Average physical properties of the components :

| Product reference | Aspect - Colour                           | Brookfield LVT viscosity<br>at 25°C in mPa.s<br>According to MO-051 | Density at 25°C<br>According to MO-032 |
|-------------------|-------------------------------------------|---------------------------------------------------------------------|----------------------------------------|
| SL240000          | Yellow to amber<br>Opaque liquid          | 550                                                                 | 1,04                                   |
| SL285000          | Light to dark amber<br>Transparent liquid | 650                                                                 | 1,09                                   |
| SL000105          | Light amber<br>Transparent liquid         | 3300                                                                | 1,08                                   |
| SL000502          | Light amber<br>Transparent liquid         | 2500                                                                | 1,05                                   |

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### Application properties depending on the requested hardness :

| Shore hardness                                                  | 40A                                                       | 50A     | 60A     | 70A     | 85A     | 35-40 D | 50-55D  |
|-----------------------------------------------------------------|-----------------------------------------------------------|---------|---------|---------|---------|---------|---------|
| HPE 40A Polyol SL240000                                         | 100                                                       | 75      | 50      | 25      | 0       |         |         |
| HPE 85A Polyol SL285000                                         |                                                           | 8       | 16      | 24      | 32      | 50      | 75      |
| HPE 40-85A ISO SL000105                                         | 100                                                       | 100     | 100     | 100     | 100     | 50      |         |
| HPE55D ISO SL000502                                             |                                                           |         |         |         |         | 50      | 100     |
| BROOKFIELD LVT viscosity at 25°C (mPa.s)<br>According to MO-051 | 2000                                                      | 2400    | 2700    | 3000    | 3200    | 1800    | 1300    |
| Potlife on 200g at 25°C<br>According to MO-062                  | 60 min.                                                   | 55 min. | 50 min. | 45 min. | 40 min. | 25 min. | 18 min. |
| Demoulding time at 25°C                                         | 24h                                                       | 24h     | 24h     | 24h     | 24h     | 12h     | 10h     |
| Demoulding time at 70°C<br>(on 3mm)                             | 3h                                                        | 3h      | 3h      | 3h      | 3h      | 2h      | 2h      |
| Total curing time at room temperature (18-25°C)                 | 5 to 7 days                                               |         |         |         |         |         |         |
| Total curing time in an oven                                    | 24h at room temperature + 16h at 70°C + 48h at room temp. |         |         |         |         |         |         |

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

- Average values measured on specimens after post-curing: 24h at room temperature + 16h at 70°C + 48h at room temperature

|                                    | Unit    | Standard                                 |         |         |         |         |         |         |         |
|------------------------------------|---------|------------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Hardness                           | Shore A | ISO 868 : 2003                           | 40      | 50      | 60      | 70      | 85      | 90      |         |
|                                    | Shore D | ISO 868 : 2003                           |         |         |         |         |         | 35-40   | 50-55   |
| Working temperature                | °C      | -                                        | -40/+90 | -40/+90 | -40/+90 | -40/+90 | -40/+90 | -40/+90 | -40/+90 |
| Maximum casting thickness          | mm      | -                                        | 100     | 80      | 80      | 60      | 50      | 30      | 20      |
| Elongation at break at 23°C        | %       | ISO 37 : 2012                            | 270     | 400     | 500     | 800     | 900     | 460     | 325     |
| Tensile strength at break at 23 °C | MPa     | ISO 37 : 2012                            | 2,7     | 3,6     | 6       | 7,2     | 13      | 14      | 16      |
| Tear resistance at 23°C            | kN/m    | ISO 34-1 : 2015                          | 11,5    | 18      | 27      | 40      | 54      | 58      | 70      |
| Abrasion resistance                | mg/100U | ISO 9352 : 2012<br>Taber<br>(1000Tr/H22) | < 5     | < 5     | < 5     | < 10    | 18      | 27      | 35      |

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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 :**

***All the components have to be homogeneous before using the products. Depending on the storage conditions, a crystallization can appear into the polyol components.***

*In this case, place the container in a 40 - 50°C oven until the product is homogenous again.*

#### **→ Application process for mixing machine :**

1. Check the homogeneousness of the polyol and isocyanate components before pumping or filling the tanks of the machine.
2. The support (part or mould) must be totally dry, without any trace of moisture.  
Make sure that a proper release agent is used.
3. Depending on the selected hardness :
  - In Shore A hardnesses, the two polyol components have to be mixed in the chosen ratio before filling the tanks.
  - In Shore D hardnesses, the two isocyanate components have to be mixed in the chosen ratio before filling the tanks.
4. If a pigment is added, it should imperatively be mixed to the polyol component, in the dedicated tank. A 1 to 3% rate of the total product quantity (polyol + isocyanate) is recommended.
5. Before casting, check the mixing ratio at the top of the mixing head, according to the selected hardness.
6. Realise the injection on the support or inside the mould. Once the injection is done, let the polymerisation happen at room temperature to help the self-degasification of the product.
7. Demoulding is possible after:
  - 10 to 24h at room temperature, depending on the requested hardness and the thickness of the part
  - 2 to 3h at 70°C, depending on the requested hardness and the thickness of the part
8. The final hardness and mechanical properties of the material are obtained after :
  - 5 to 7 days at room temperature.
  - 24h at room temperature + 16h at 70°C + 48h at room temperature

#### **→ Application process for hand casting :**

1. The support (part or mould) must be totally dry, without any trace of moisture. Make sure that a proper release agent is used.
2. Rehomogenise the polyols and the isocyanates.
3. Depending on the selected hardness :
  - In Shore A hardnesses, the two polyol components have to be mixed in the chosen ratio before filling the tanks.
  - In Shore D hardnesses, the two isocyanate components have to be mixed in the chosen ratio before filling the tanks.
4. If a pigment is added, it should imperatively be mixed to the polyol component, in the dedicated tank. A 1 to 3% rate of the total product quantity (polyol + isocyanate) is recommended.

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5. Weigh the components and mix them with a spatula or a low-speed rotational mixer.
6. Degas the mixture under vacuum if necessary, depending on the complexity of the part and the details that are likely to retain air bubbles.
7. Cast the product on the support or inside mould. Once the casting is done, let the polymerisation happen at room temperature to help the self-degasification of the product.
8. Demoulding is possible after :
  - 10 to 24h at room temperature, depending on the requested hardness and the thickness of the part
  - 2 to 3h at 70°C, depending on the requested hardness and the thickness of the part
9. The final hardness and mechanical properties of the material are obtained after :
  - 5 to 7 days at room temperature.
  - 24h at room temperature + 16h at 70°C + 48h at room temperature

#### **Packaging :**

- HPE 40A-POLYOL-SL240000 : Box of 6 x 1,0 kg = 6 kg / 4 x 5,0 kg = 20 kg
- HPE 85A-POLYOL-SL285000 : Box of 6 x 1,0 kg = 6 kg / 4 x 5,0 kg = 20 kg
- HPE 40-85A-ISO-SL000105 : Box of 6 x 1,0 kg = 6 kg / 4 x 5,0 kg = 20 kg
- HPE55D-ISO-SL000502 : Box of 6 x 1,0 kg = 6 kg / 4 x 5,0 kg = 20 kg
- System HPE kit 40-85 A, box of 1 kit with :  
(4 x 1,0 kg of HPE 40A polyol) + (2 x 1,0 kg of HPE 85A polyol) + (2 x 5,0 kg of HPE 40-85 A Iso) = 16 kg

#### **Storage :**

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

*Once the packaging is opened, it must be closed back tightly on a hermetic, moisture freeway, after each use, if possible under an inert atmosphere.*

#### **Comment :**

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