

## Epoxy-Systems HP-E28L, HP-E55L, HP-E110L

- Epoxy Laminating Resin Systems -

The Epoxy-Systems HP-E28L, HP-E55L and HP-E110L are unfilled, low viscous, 2-component combinations of resin and hardener with working times between 28 - 110 minutes.

**These are low-priced standard laminating resins with good dimensional stability and wetting properties.**

### Properties:

- Very good wetting properties of the reinforcing fibres
- Cold setting, de-mouldable at room temperature
- Free of solvents and fillers
- Improved physiological compatibility (no R62 labelling)
- Practically shrink-free curing
- Temperature resistance (Tg Max) **up to 81°C** (E55L)

### Field of application:

As impregnating and laminating resins in the areas of

- Mould-making and fixture construction, industrial parts
- Construction of sports equipment, model making
- Orthopaedic
- Vehicle substructures / motorsport
- Boat construction

HP-E28L, HP-E55L and HP-E110L are free of Nonylphenol and DETA.

**Note:** The resin components of HP-E28L, HP-E55L and HP-E110L are identical. Furthermore, the hardeners are mixable among themselves.

### Processing Data:

		HP-E28L	HP-E55L	HP-E110L
Colouring (mixture)		Slightly bluish / green		
Mixing ratio (resin : hardener)	[weight]	<b>100:40</b>		
	[volume]	100:44		
Mixing viscosity (at 20°)	[mPa s]	(low viscous)		
<b>Mixing viscosity (at 25°)</b>	<b>[mPa s]</b>	<b>(low viscous)</b>		
<b>Pot life time (at 20°C)</b>	<b>[minutes]</b>	<b>28</b>	<b>55</b>	<b>110</b>
De-mouldable (at 20°C)	[h]	28	36	56
De-mouldable (at 40°C)	[h]	6-7	8	10
Processing temperature (optimal)	[°C]	15 - 25	20 - 25	20 - 25
<b>Processing temperature (minimum)</b>	<b>[°C]</b>	<b>15</b>	<b>18</b>	<b>18</b>

### Raw Material Data:

		HARDENER				
		RESIN	HP-E28L	HP-E55L	HP-E110L	
Viscosity (at 25°C)	[mPa s]	600 - 900	200 - 300	50 - 100	40 - 90	HP.07.0003
Density (at 20°C)	[g/cm³]	1.1 - 1.15	0.96 - 1.04	0.96 - 1.04	0.96 - 1.04	HM.07.0002
(NH)-equivalent	[g/EQ]		68 - 70	68 - 70	68 - 70	HM.07.0014
Epoxy-equivalent	[g/EQ]	185 - 200				HM.07.0013

### Physical Properties of Cured Epoxy without reinforcement material:

		HP-E28L	HP-E55L	HP-E110L	
Tensile strength	[N/mm²]	60 - 70	60 - 70	55	HM.07.0004
Elongation	[%]	3 - 5	4 - 5	2 - 3	HM.07.0004
Flexural strength	[MPa]	100 - 110	100 - 110	n. s.	HM.07.0005
Elastic modulus (bending test)	[GPa]	3	3	3.1	HM.07.0004
Hardness (after tempering 2h/120°C)	[Shore D]	83	85	85	HP04.07
Glass transition temperature Tg MAX	[°C]	75	81	75	HP04.08

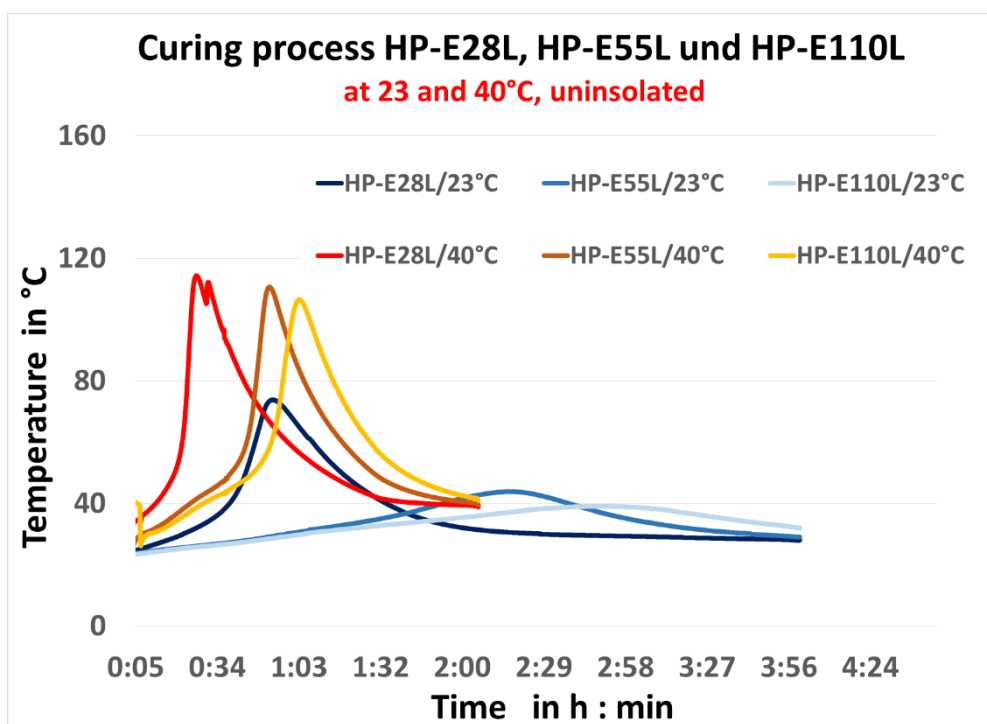
The physical data was found out on an unfilled test specimen.  
The hardening occurred (unless otherwise stated) for 24h at 23°C + 6h at 80°C.

### Curing and Exothermic reactions:

Results are based on method HP04.051.

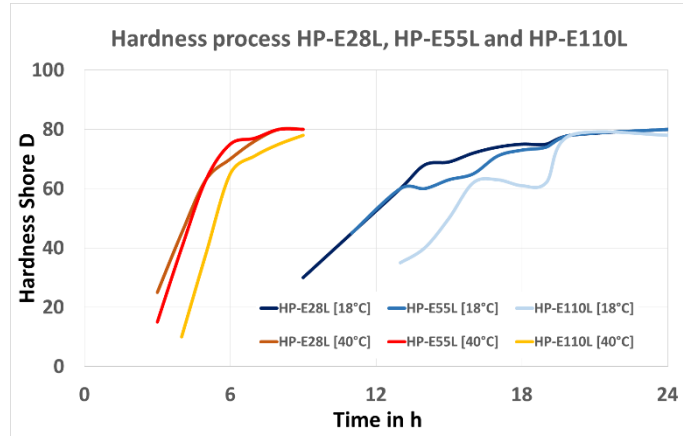
Here, resin and hardener are brought to 23°C and mixed stoichiometrically (100:40 by weight).  
The measuring was made at the bottom of an alu-cup at a 100g mixture (internal method).

Higher temperatures or larger mixtures reduce the pot life!



### Hardening over Shore Hardness D:

Results are based on method HP04.04. Here, resin and hardener are mixed (100:40 by weight). After that, 10g are filled in an aluminium measuring bowl and the hardness (Shore D) is measured periodically under isothermal conditions.



### Temperature Peaks:

	at 23°C			at 40°C		
	HP-E28L	HP-E55L	HP-E110L	HP-E28L	HP-E55L	HP-E110L
up to T <sub>max</sub> [h:mm]	approx. 0:55	approx. 2:18	approx. 2:51	approx. 0:28	approx. 0:53	approx. 1:05
T <sub>max</sub> [°C]	74	44	39	113	110	105

### Gel Time / Demouldability:

		HP-E28L	HP-E55L	HP-E110L
Gel time after	[h/20°C]	3 - 5	4 - 6,5	5 - 7
Gel time after	[h/40°C]	2 - 2,5	2,5 - 3	2,5 - 3,5
De-mouldable at 20°C	[h]	28	36	56
De-mouldable at 40°C	[h]	6-7	8	10

### Tempering:

For epoxy resin systems achieves its final strength after 7 days at 20°C (literature values). This time frame can be reduced by increased temperatures or a specific tempering.

**Possible tempering cycles: 24h/23°C + 5h at 60°C + 6h at 80°C**

We generally recommend to temper for optimal component properties. By tempering of the composite, the properties of the components can be improved. Furthermore, the heat stability will be increased. But beforehand, all components should cure non-adhesively.

### Safety Instructions:

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The safety instructions can be found on the respective container.

Do not allow children to handle. Prevent inhalation of fumes and contact with bare skin. Wear suitable protective gloves and safety goggles. During use, do not eat, drink or smoke. For detailed information, please refer to the corresponding safety data sheets.

The epoxy system has a high resistance against crystallization.

However, at very low temperatures, a crystallization of the hardener may occur. The process is reversible e.g. by heating it to 40°C in a water bath. A complete melting is important. Storage and processing with air admission may lead to carbamate formation (white coloration).

### Application Instructions:

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We recommend tests be performed for trials and suitability for the particular type of application. The system should only be used in the mentioned temperature conditions. The relative air humidity should not be above 70%. In respect of the safety instructions the epoxy resin and hardener should be mixed in a suitable mixing vessel in accordance with characteristics given in the data sheet. Deviating from the mixing recommendations can lead to incomplete hardening and through that to a loss of performance.

Ensure that the edges are well mixed using a stirring stick or a propeller type mixer. Streaks indicate insufficient stirring and mixing of the components. Larger amounts (more than 100g) and higher temperatures (higher than 20°C) reduce the pot life time.

Mixtures which rise to over 40°C in the mixing vessel should not be used any further since processing is associated with property losses. Increases in temperature can be reduced by pouring the mixture into flat painting trays.

### Cleaning of Work Tools:

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Unhardened product remains can be removed from tools by means of acetone or Thinner XB. Tools should be given a good airing after being cleaned with these solvents, in order to prevent the solvent from being retained until the tool is used again. Hardened remains can only be removed by mechanical means.

### Storage:

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Threaded container tops should be kept free from material remains. Do not exchange tops/lids. Close opened containers tightly. With optimal storage conditions, shelf-life should be beyond 12 months.

### Deliverable Quantities:

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Plastic containers with safety fastening in different quantities.  
Larger containers (e.g. barrels) can be obtained upon request.

### Disposal:

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Do not allow to enter drains, waterways or soil. Uncured product residues are hazardous waste. The cured system is construction site waste / household waste.

### Further Information:

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Further information can be obtained from our website, by selecting Product Info on the homepage. Please do not hesitate to contact us by telephone if you have further queries.

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With the newest printing of this data sheet the previous version loose validity!