

Epoxy Coating (Gelcoat/Topcoats)

Epoxy Resin Systems HP-E25D / HP-E25DM and HP-E40D

- Epoxy Gelcoat / Topcoats -

The mentioned epoxy-systems are unfilled combinations of resin and hardener from short up to medium working times for several applications.

Features & Benefits:

for laminating and coating / covering:

- high resistance to UV radiation, very slight yellowing
- good wet-out of reinforcement fibres
- cause bright, non-gluey (tack-free) surfaces and casts; suitable for carbon-look laminates (observe Tg MAX)
- cold-hardening, applicable from 10°C

HP-E25D:

- epoxy-topcoat, for transparent coatings, low-viscosity

HP-E25DM:

- base for epoxy-gelcoat, first resin layer in (female) moulds, medium-viscosity
To get suitable thixotropic, it is necessary to add 3-4 % HP-PK22 (by weight).

HP-E40D:

- Transparent coating (floor coating as well) or casting up to 10mm layer-thickness.
- Suitable for building of stone carpets.

For maximum UV-stability, we recommend an additional coating with a clear varnish like HP-PUR.
Also the long term UV-resistance can be improved by adding HP-BEL91 (in epoxy and in varnish) distinctly!
All Gelcoats and Topcoats can be coloured with dry pigments and dyes
HP-Textiles offers coloured epoxy-topcoats, too!
Special formulation allows processing under difficult conditions (low temperatures, air humidity).
The mentioned products are free of nonylphenol and contain no DETA.

Please note: The hardener of HP-E25D and HP-E25DM are the same.
Also, both resin components can be mixed among themselves.

Product Properties:

		HP-E25D	HP-E25DM	HP-E40D
Colouring		colourless / clear		
Mix ratio (resin : hardener)	[by weight]	100:60		100:50
	[by volume]	100:64	100:66	100:57
Mixed viscosity (at 20°)	[mPa s]	700 - 1100 (low viscosity)	7000 - 9500 (medium viscosity)	700 - 1100 (low viscosity)
Mixed viscosity (at 25°)	[mPa s]	500 - 700 (low viscosity)	1800 - 2200 (medium viscosity)	300 - 500 (low viscosity)
Working time / pot life (at 20°C)	[minutes]	25	25	40
walkable (shore D40 after)	[h]	6	3	15
Processing temperature (optimum)	[°C]	15-25	15-25	15-25
Processing temperature (minimum)	[°C]	10	10	10

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Product Specifications:

HP-E25D		RESIN	HARDENER	
Viscosity (at 25°C)	[mPa s]	700 - 1100	300 - 400	HP.07.0003
Density (at 20°C)	[g/cm³]	1,10 - 1,12	1,05 - 1,06	HM.07.0002
(NH)-Equivalent	[g/EQ]		113 - 117	HM.07.0014
Epoxy-Equivalent	[g/EQ]	185 - 195		HM.07.0013

HP-E25DM		RESIN	HARDENER	
Viscosity (at 25°C)	[mPa s]	7000 - 9500	300 - 400	HP.07.0003
Density (at 20°C)	[g/cm³]	1,15 - 1,17	1,05 - 1,06	HM.07.0002
(NH)-Equivalent	[g/EQ]		113 - 117	HM.07.0014
Epoxy-Equivalent	[g/EQ]	185 - 195		HM.07.0013

HP-E40D		RESIN	HARDENER	
Viscosity (at 25°C)	[mPa s]	700 - 1100	50 - 150	HP.07.0003
Density (at 20°C)	[g/cm³]	1,10 - 1,12	1,02 - 1,03	HM.07.0002
(NH)-Equivalent	[g/EQ]		93 - 97	HM.07.0014
Epoxy-Equivalent	[g/EQ]	185 - 200		HM.07.0013

Data of unreinforced resin:

		HP-E25D	HP-E25DM	HP-E40D	
Tensile strength	[N/mm²]	55	65	43	HM.07.0004
Elongation	[%]	7	5	4	HM.07.0004
Flexural strength	[MPa]	75	90	75	HM.07.0005
E-Modulus	[GPa]	3	3	3	HM.07.0004
Hardness	[Shore D]	85	85	85	HP04.07
Glass trans. temperature T _g MAX ¹	[°C]	45	69	50	HP04.08

Specifications with unreinforced resin, after curing for 24h at 23°C + 15h at 80°C

¹For carbon design surfaces, it is alternatively suitable to use HP-E200GL.
This epoxy-system achieves a higher T_g MAX in the amount of 107°C.

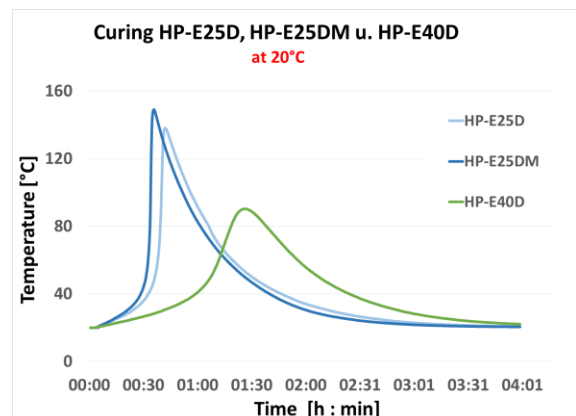
Curing and exothermic progress:

According to HP04.051.
In this case, resin and hardener will be tempered at 23°C and 100g mixed.
The sensing element is placed on the bottom of the cup.

Higher temperature or bigger amounts will cause to reduction of the processing time (pot life).

Temperature peak:

	HP-E25D	HP-E25DM	HP-E40D
t up to T _{max} [h:mm]	ca. 0:42	ca. 0:36	ca. 0:53
T _{max} [°C]	138	149	90



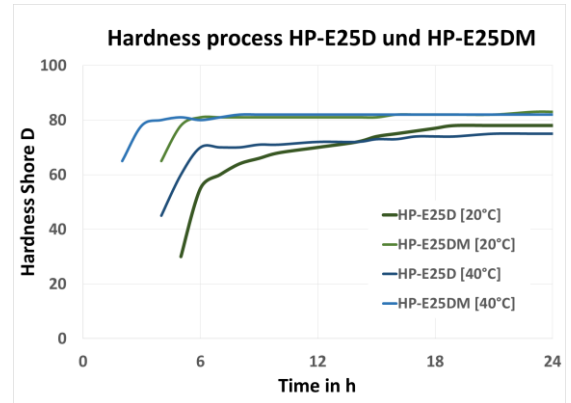
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Curing and hardness:

According to HP04.04. Mixing resin and hardener.
Amounts of 10g will be placed in cups and hardness will be measured under isothermic conditions.

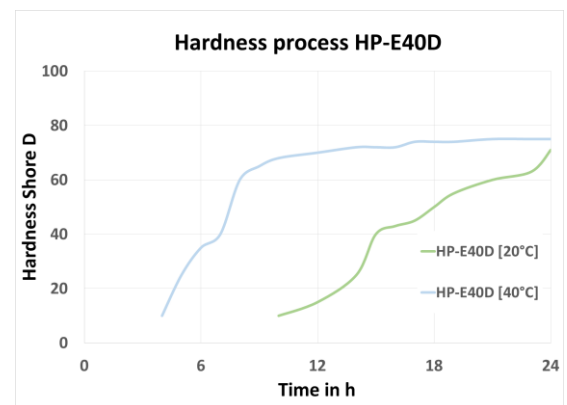
Hardness:

at 20°C	HP-E25D	HP-E25DM	HP-E40D
Shore D 40	6h	3h	15h
Shore D 60	7h	4h	21h



Hardness:

at 40°C	HP-E25D	HP-E25DM	HP-E40D
Shore D 40	4h	1h	7h
Shore D 60	5h	2h	8h



Topcoat HP-E40D for stone carpets:

Depending on aggregate diameter, amounts between 5-8% (by weight) are common.
In areas with higher air-humidity (bathrooms, pools,...) a sealing of the porosities in the surfaces are recommended.
For external applications, an additional sealing with suitable PUR (like HP-PUR) is necessary, to achieve a better UV-resistance.

Safety instructions:

The safety instructions are to be taken as being of greatest importance. Do not allow children to handle. Prevent inhalation of the fumes and contact with the bare skin. Wear approved protective gloves and goggles. If ingested do not eat, drink or smoke. During the hardening process, energy can be released in the form of heat, hence a cooling/heat exchanging should be provided in order to prevent hot spots. Only mix the components in the recommended proportions in accordance with the instructions.

Higher resistance against crystallization.

However, at very low temperatures, a crystallization of the hardener may occur. The process is reversible e.g. by heating it in a water bath to 40-60°C. A complete melting is important. Storage and processing with air admission may lead to carbamate formation (white coloration).

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Application Instructions:

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 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 loss of performance.

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

Note: If the temperature in the process go above 40°C then it is not possible to continue further, as the process will lead to a loss of certain characteristics and properties. Increases temperature can be reduced by pouring the mixture into flat painting trays.

Generally for epoxy: Full cure (strength) after 7 days at 20°C (literature value).

Higher temperatures will decrease this time.

Improved heat resistance and better mechanical properties can be achieved by tempering (post-curing).

Post-curing level: 24h/23°C + 5h / 60°C

Colouring and transparency:

All raw materials are subject to constant quality inspection. Caused by minimum differences in reaction processes are colour deviations possible. All products are obtained in accordance with the requirements of the specifications. According to Beer-Lambert law, the apprehended colouring depends on the layer thickness.

Because of this, the epoxy may seem yellowish. In thin layers, this is usually uncritical.

Cleaning work tools:

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 in a process. Hardened remains can only be removed by mechanical means.

Storage:

Threaded container tops should be kept free of material remains. Do not exchange tops/lids.

With optimal storage conditions, shelf-life should be beyond 12 months.

Deliverable quantities:

Plastic containers with safety fastening in several quantities.

Larger containers can be obtained upon request.

Disposal:

Do not dispose of through the sewerage system, on areas of open water, or in the soil. Non-hardened remains of the product should be disposed of as hazardous waste. The hardened product waste should be treated as building rubbish or household rubbish.

Further Information:

Further application 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.

Information presented herein has been compiled from sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. It is the user's responsibility to determine for himself the suitability of any material for a specific purpose and to adopt such safety precautions as may be necessary. We make no warranty as to the results to be obtained in using any material and, since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any material supplied by us. We recommend tests be performed for trials and suitability for the particular type of application.

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