

# Epoxy resins

## Practical tips



**HP-TeXtiles**

# About us



Since the company was founded in 2004, HP-Textiles GmbH has stood for the development and distribution of fiber composites. In addition to a wide range of fiber reinforcement materials and specially formulated epoxy resins, DeinTeich.de and bredderpox® were created as additional strategic business areas were created. As a result, in addition to the composites industry, users from the pool construction and surface protection systems sectors are also among our satisfied customers.our satisfied customers.

## Our Business areas

**HP-TeXtiles**

Composite materials



[www.hp-textiles.com/shop](http://www.hp-textiles.com/shop)

**DeinTeich.de**  
Teich Pool Deck

GRP coatings



[www.deinteich.de](http://www.deinteich.de)

**bredderpox®**

Building Chemistry



[www.breddermann-kunstharze.de](http://www.breddermann-kunstharze.de)

in order to guarantee our business partners a continuously high quality of our services as well as optimal process reliability, the quality management of HP-Textiles was certified according to DIN EN ISO 9001 in 2011. Through the enthusiasm and passion for scientific research, coupled with the understanding of our customers' wishes, we guarantee optimal product properties also in the future.

Together with strong partners from science and industry, we also offer custom synthesis and manufacturing of a wide variety of products. The establishment of a networked, development allows us to respond to customer requirements even at short notice. Variable batch sizes enable us to supply large industrial customers as well as small quantities for project developments.

Our young qualified team, a arge warehouse as well as reliable logistic partners guarantee a ast processing of your order.

The continuous further development of our product range should also be a basic requirement in the future in order to guarantee optimum component properties at economical prices!

Your team from  
HP-Textiles GmbH

# Table of contents

<u>Category</u>	<u>Page</u>
Processing epoxy resins .....	4-5
Technical application notes .....	6-7
Further information .....	7
Overview of epoxy resins .....	8-11
Troubleshooting during processing .....	12-15
FAQ .....	16-17
Videos and working instructions .....	18
Notes .....	19

# Processing epoxy resins

## ... Safety

When processing epoxy resin systems, the usual precautions when handling chemicals, as well as applicable official occupational safety and environmental regulations, must be observed:

Keep out of reach of children. Avoid inhaling fumes and product contact with skin. Wear appropriate protective gloves and goggles. Do not eat, drink or smoke when using. The safety instructions can also be found in the respective containers or in the safety data sheets.

## ... Preliminary tests

Each project is different and has individual requirements for the epoxy resins. There are many possible combinations. There is no universal „guarantee of success“ due to the many influencing factors!

**Preliminary tests must be carried out to check suitability for the respective application!**



## ... Humidity, temperature and residual moisture in the substrate

The relative humidity of the environment must not exceed 70%. Humidity and other air components can lead to undesirable side effects. Observe the specified minimum temperature for processing. Exact data can be found in the respective data sheets of the systems. If the ambient or surface temperature is too low, this can significantly slow down the curing process. Any wax-like films that form must be removed with plenty of water before applying a subsequent coat. The surface should then be sanded.

When applying outdoors, please note that the substrate temperature may differ from the outside temperature. Similarly, curing overnight can lead to water condensation (dew) due to the drop in temperature, which can have an unfavorable effect on the surface quality.

**Low temperatures (<10°C) can lead to changes in the state of some products. Therefore, bring the products to a core temperature of 20°C before processing and check the homogeneity and consistency.**

Epoxy resins and their hardeners may crystallize if stored at too low temperatures, but this is reversible without any loss of properties. The material must be returned to a homogeneous state by heating (e.g. at 50°C in a water bath) before processing.

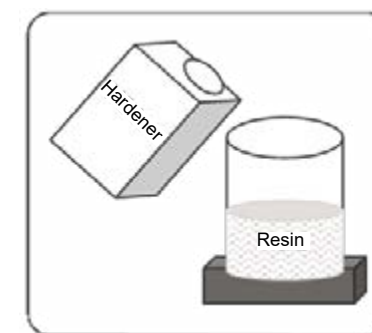
Substrates with a residual moisture content of up to max. 6% should be pre-treated with our primer HP-E80FS.

### Tip:

Use peel ply at low temperatures! If unwanted secondary compounds form on the surface, these are automatically removed by peeling off the peel ply! This eliminates the need for time-consuming cleaning and sanding work.

## ... Weighing in

The quantities of the individual preparations must be adjusted to the respective work step. Stir or shake all components thoroughly before dosing. Sufficient homogeneity of the individual components is essential for smooth curing. Weigh the resin and hardener in a suitable mixing container in accordance with the characteristics in the product data sheet, observing the safety instructions.

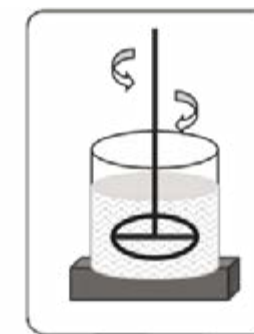


Prepare resin, add hardener...

In principle, the specified ratio between **Resin** : **Hardener** must be strictly adhered to and precisely measured! Deviations from the mixing ratio lead to incomplete curing and thus to a loss of properties. The use of mass measuring devices (scales) is absolutely preferable to volume measuring devices (measuring beakers) due to their higher accuracy. Suitable devices include digital bench scales (e.g. HP-VZ3006 and HP-VZ3010).

## ... Mixing

Mix thoroughly and intensively with a stirring rod, including the edge zones and the base of the beaker. From a batch size of 2 kg, the use of mechanical stirring equipment (drill + HP-L1051 stirring paddle) is recommended. Any streaks still present indicate insufficient mixing. The process of re-potting is recommended, whereby the already mixed mass is transferred to a second mixing vessel and stirred again. Larger batch sizes (>100g) and higher temperatures (>20°C) shorten the processing time. Preparations that rise to over 40°C in the mixing vessel should not be used any further, as processing is associated with a loss of properties. Temperature increases are delayed by pouring the mixture into shallow paint trays.



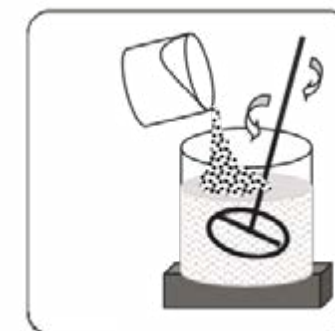
...Intensive mixing...

## ... Addition of additives, fillers and colorants

Various property-changing additives, fillers or colorants can be added to adjust the desired properties. The entire mixture should then be stirred thoroughly again before processing.

### Note:

Fillers, especially some color pigments or metals, can influence the reaction kinetics. As a result, pot life or curing times can be significantly longer or shorter. Furthermore, temperature resistance, tensile strength and other properties of the base system can be negatively affected.



... Add fillers as required and mix thoroughly again.

# Technical application notes

## ...Laminating resins

If fabric layers are used, these are cut to size as required and applied to an appropriately prepared negative or positive mold with release agent. After spreading the epoxy mixture, impregnation and deaeration is carried out using suitable equipment (laminating or deaeration roller, e.g. HP-RR). For a homogeneous bond, all layers should be laminated „wet on wet“. The strength of the final body depends on the number of fabric layers.

## ...Post-curing / Tempering

In order to achieve better overall strength of fiber composite components and resistance to chemicals, epoxy resins should be subjected to post-curing under heat („tempering“). This process achieves a higher degree of cross-linking in the polymer backbone. The glass transition temperature (Tg) is the most important parameter for describing the application temperatures of the respective components and indicates the temperature at which the plastic softens significantly. If components are heated to just below the respective Tg during the production process and this temperature is maintained for some time, this is referred to as tempering or post-curing.

### Rules for the tempering process

- The component must be absolutely tack-free before tempering. Otherwise there is a risk of the matrix (EP resin system) running off if the initial curing is insufficient.
- With increasing temperature, laminates are no longer dimensionally stable, so there is a risk of irreversible warping of the component if tempered outside the mold.
- The target temperature should be reached slowly and evenly.
- It is equally important that the object is not cooled down to room temperature immediately after the tempering process has been completed, otherwise there is a risk of internal stresses remaining.
- Take the application temperature of the release agent into account!

### Example:

1. example for the epoxy system HP-E3000GL:  
5h at 60°C + 6h at 80°C. For „Tg MAX“ additionally 2 h at 120°C

2. example for the epoxy system HP-E56L:  
24h at 23°C + 5h at 60°C + 6h at 80°C

## ...Topcoat resins

Due to the surface energy, coating already cured epoxy surfaces with epoxy topcoat systems is challenging. There is a risk of the formation of „orange peel / fish eyes“. This effect can be avoided as follows:

- Embedding of a lightweight glass fiber fabric with a high-quality finish sizing (e.g. HP-P28EF or HP-P49EF) in the top layer.
- Rough sanding of the hardened epoxy substrate, including degreasing (acetone HP-AC) or the use of peel ply.
- Processing on a still sticky, lower layer (working „wet-on-wet“) also counteracts surface defects.
- Addition of a suitable thixotropic agent (e.g. 3-4 % by weight of HP-PK22).
- Furthermore, in some cases the use of other additives (e.g. leveling agent HP-BEL71) is possible.

## ...Weathering of epoxy resin systems

### Sunlight (UV radiation):

Due to aromatic molecular components, epoxy resin systems tend to yellow in direct sunlight. This can lead to color changes, especially with light-colored objects. This effect is further intensified by heat. To counteract this process, we offer coordinated UV stabilizers (e.g. HP-BEL91).

### Sunlight (UV radiation) + moisture:

Combined or alternating exposure to sunlight and moisture leads to matting of the surface (chalking). Certain additives, such as color pigments, can promote this process. Epoxy resins are also prone to thermal yellowing, particularly when exposed to heat. We offer special, low-chalking finishing systems.

# Further information

## ...Work equipment cleaning

Uncured product residues can be removed from tools with acetone (HP-AC) or thinner (HP-XB). Tools must be thoroughly aired out after washing out with solvents to prevent the cleaner from entering subsequent mixtures.

Cured material can only be removed mechanically e.g. by sanding.

## ...Storage

Remove any product residue from the screw cap. Do not mix up the lids. Close opened containers tightly. Store in a cool and dry place. Shelf life at least 12 months if stored optimally.

## ...Delivery package

Plastic containers with safety closure or drums.  
Larger containers (e.g. containers) on request.

## ...Waste disposal

Do not allow to enter drains, bodies of water or soil. Uncured product residues are hazardous waste. The hardened system is construction site waste/household waste.



Overview of epoxy resins

	DESCRIPTION / SPECIAL FEATURES	GROUNDING	LAMINATING	INFUSIONING	BONDING	SURFACES	POURING	FILLING		VISCOSITY  each <b>higher</b> , the <b>tougher</b>	MIXING RATIO  (Weight) Resin / Hardener	COLOR	TOP TIME  ( min at 20°C )	TEMPERATURES  ...Processing min.(recommended)    ...Load capacity Tg MAX in C°	
Priming systems															
HP-UC-...	Priming of smooth substrates (plastic, glass, metal, tiles...)									■ ■ □ □	100 / 50	black -9004 white - 9003	20 - 30	18 (25°C)	n. V.
HP-E80FS	Primer for porous substrates (mineral, wood, metal...), dilutable with XB									■ ■ □ □	100 / 60	brownish	35	15 (20°C)	n. V.
Filler system															
HP-E30S	Filled filler system for e.g. osmosis remediation									■ ■ ■ ■	100 / 50	light green - matt	30	15 (20°C)	115°C
Adhesive systems															
HP-E5K	High-quality 5min epoxy resin for bonding & joining of components									■ ■ ■ □	100 / 100	brownish	5	5 (20°C)	80°C
HP-E60K	Epoxy resin with long pot life for large-area bonding / joining, slightly tacky on the air side									■ ■ ■ □	100 / 50	brownish	60	15 (20°C)	60°C
HP-E120K										■ ■ ■ □	100 / 50	brownish	120	15 (20°C)	80°C
Laminating systems															
HP-E28L	Low-viscosity impregnating & laminating resin for many applica- tions									■ ■ □ □	100 / 40	transparent blue	28	15 (20°C)	75°C
HP-E55L										■ ■ □ □	100 / 40	blue	55	18 (20°C)	81°C
HP-E110L										■ ■ □ □	100 / 40	blue	110	18 (20°C)	75°C
HP-E29L	High-load resins, improved physiological compatibility									■ ■ □ □	100 / 40	slightly bluish	25	15 (20°C)	93°C
HP-E56L										■ ■ □ □	100 / 40	slightly bluish	55	18 (20°C)	90°C
HP-E111L										■ ■ □ □	100 / 40	slightly bluish	110	20 (20°C)	79°C
HP-E30TLS	Laminating resin for pond and pool coatings									■ ■ □ □	100 / 60	slightly yellowish	30	15 (20°C)	50°C
Topcoat systems															
HP-E25D	Topcoat with improved UV resistance, as first (fine) layer in negative molds, visible carbon, osmosis protection, Forms clear, tack-free surfaces									■ □ □ □	100 / 60	colorless	25	10 (20°C)	45°C
HP-E25DM										■ ■ ■ □	100 / 60	colorless	25	10 (20°C)	69°C
HP-E40D										■ □ □ □	100 / 50	colorless	40	10 (20°C)	48°C
HP-30TDS	Transparent or colored according to RAL, floor, agricultural and industrial coatings, pond, pool and boat coatings <sup>2</sup>									■ ■ ■ ■	100 / 53	colorless or according to RAL	30	15 (20°C)	50°C
Highly heat-resistant systems															
HP-E120WSM	High heat resistance, multi-purpose system, good resistance to fuels									■ ■ ■ □	100 / 26	very transparent <sup>1</sup> (visible carbon)	120	18 (20°C)	150°C
HP-E120WSI	High heat resistance / particularly suitable for vacuum injection processes (IMC/MTI, RI, VARI,...) visible carbon									■ □ □ □	100 / 26	very transparent <sup>1</sup> (visible carbon)	120	18 (20°C)	125°C

■ = very well suited   ■ = suited   ■ = Conditionally suitable   □ = not suitable

■ □ □ □ Very low viscosity   ■ ■ ■ □ viscous  
■ ■ □ □ liquid   ■ ■ ■ ■ pasty

n.V. = Values not available  
<sup>1</sup> = depending on the selected  
<sup>2</sup> = Depending on the color shade, color change / chalking possible under sunlight!

DESCRIPTION / SPECIAL FEATURES		GROUNDING	LAMINATING	INFUSIONING	BONDING	SURFACES	POURING	FILLING		VISCOSITY  each <b>higher</b> , the <b>tougher</b>	MIXING RATIO  (Weight) Resin / Hardener	COLOR	TOP TIME  ( min at 20°C )	TEMPERATURES	
														.... <b>Processing</b> min.(recommended)	.... <b>Load capacity</b> Tg MAX in C°
Multi-purpose systems															
HP-E25L	Multi-purpose system, unfilled mold making/filler system, chemical resistant									■ ■ ■ □	100 / 60	light yellow	25	<b>15</b> (20°C)	55°C
HP-E25KL										■ ■ ■ □	100 / 60	light yellow/clear	25	<b>5</b> (20°C)	78°C
HP-E45L										■ ■ ■ □	100 / 60	light yellow	45	<b>18</b> (20°C)	50°C
HP-E45KL										■ ■ ■ □	100 / 60	light yellow/clear	45	<b>15</b> (20°C)	66°C
HP-E25TU	Laminating and top coat resin for desert terrariums, suitable for UV lamps									■ ■ □ □	100 / 60	light yellow/clear	25	<b>10</b> (20°C)	69°C
HP-E25TMU										■ ■ ■ □	100 / 60	light yellow/clear	25	<b>10</b> (20°C)	45°C
HP-E45T	Laminating and top coat resin for terrariums, paludariums									■ ■ □ □	100 / 60	light yellow/clear	45	<b>15</b> (20°C)	50°C
HP-E45TM	Laminating and top coat resin for terrariums, paludariums, aquariums, also marine aquariums									■ ■ ■ □	100 / 60	light yellow/clear	45	<b>15</b> (20°C)	66°C
Injection systems															
HP-E15GL	Infusion resin system, RTM process, optimum impregnation and flow properties, very transparent - visible carbon									■ □ □ □	100 / 30	very transparent <sup>1</sup>	15	<b>10</b> (25°C)	91°C
HP-E200GL										■ □ □ □	100 / 30	very transparent <sup>1</sup>	200	<b>15</b> (25°C)	107°C
HP-E300GL										■ □ □ □	100 / 30	very transparent <sup>1</sup>	300	<b>15</b> (25°C)	92°C
HP-E30RI	Infusion resin system, RTM / RI process, optimum impregnation and flow properties, transparent - visible carbon									■ □ □ □	100 / 30	transparent <sup>1</sup>	35	<b>15</b> (25°C)	90°C
HP-E120RI										■ □ □ □	100 / 30	transparent <sup>1</sup>	200	<b>15</b> (25°C)	98°C
HP-E300RI										■ □ □ □	100 / 30	transparent <sup>1</sup>	300	<b>15</b> (25°C)	83°C
Casting systems															
HP-E45GB	High impact strength, residual flexibility									■ ■ □ □	100 / 60	transparent	45	<b>15</b> (20°C)	50°C
HP-E50GB	Transparent, low-shrinkage casting with tack-free surfaces Pouring heights < 1.5 cm, clear as water									■ □ □ □	100 / 50	transparent (colorless)	40	<b>10</b> (20°C)	50°C
HP-E300GB	Transparent, low-shrinkage casting with tack-free surfaces Pouring heights < 5 cm / 20°C, ideal for river tables									■ □ □ □	100 / 35	transparent (Visible carbon)	300	<b>18</b> (20°C)	45°C
HP-E400GB	Transparent, low-shrinkage casting with tack-free surfaces, crystal clear, casting heights < 10 cm, ideal for river tables									■ □ □ □	100 / 30	transparent	300	<b>15</b> (20°C)	40°C
HP-E45GA	Electro casting up to 48V, casting heights < 2 cm / 20°C									■ ■ ■ □	100 / 60	yellowish / clear	45	<b>15</b> (20°C)	67°C
HP-E45GE	Electrical potting up to 400V									■ ■ □ □	100 / 60	transparent	45	<b>15</b> (20°C)	50°C
Mold making systems															
HP-E25FB	Mold making resin with high grinding and polishing properties									■ ■ ■ ■	100 / 50	Can be dyed with color pastes	25	<b>15</b> (20°C)	65°C
HP-E30FB	Molding resin with high abrasion resistance, black or blue-grey, aluminum-filled									■ ■ ■ ■	100 / 10	black or blue- grey	30	<b>15</b> (20°C)	115°C

= very well suited    = suited    = Conditionally suitable    = not suitable

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chalking possible under sunlight!

# Troubleshooting during processing

This document contains help for faster troubleshooting in the event of deviations in the work process. You will also find a list of frequently asked questions (FAQ). We also recommend that you read our application-specific brochures carefully and refer to the data sheets for the relevant products

## ! Problem

The cast object does not harden, but remains flexible even after days at 20°C.

### ...Explanation

Over- or underdosing of the hardener.

### ...Background

The cross-linking of 2K systems is a so-called polyaddition. If too much hardener is used, it would not be cross-linked and would remain in the casting as a plasticizer. If the hardener is underdosed, the resin can autopolymerize (sole curing), but reproducible results cannot be achieved due to the many influencing variables.

### ...Rework

Objects cured in a non-optimal mixing ratio can no longer be reworked.

### ...Avoidance

Always use a suitable scale and do not deviate from the specified mixing ratio. The weighed mass should be within the medium weighing range of the measuring device. Our digital bench scales (e.g. HP-VZ3006 or HP-VZ3010) are suitable.

## ! Problem

The object is initially flexible over a longer period of time, but then becomes

### ...Explanation

Small quantities and/or low temperatures delay the curing time.

### ...Background

A chemical reaction starts when the raw components are combined; a 2-component casting resin always reacts much more slowly at lower temperatures <18°C and small batch sizes <100g (Arrhenius equation).

### ...Rework

Curing can be accelerated by applying external heat (e.g. near a heater) at max. 40°C.

## ! Problem

Sticky surfaces

### ...Explanation

Insufficient mixing leads to partial non-curing and thus to sticky surfaces. Poorly mixed areas often remain in the corners of the mixing container. If these drip onto the object, sticky areas are also created.

### ...Background

In a 2-component reaction, the reaction partners must be present in a homogeneous mass ,excess resin or hardener at certain points leads to uneven curing.

### ...Rework

Dab off any imperfections with a cloth. Coat the object again with the correctly measured mixture.

### ...Avoidance

Mix the mixture thoroughly, if necessary, transfer the mixture to a clean container after the first mixing process and mix again.

## ! Problem

Wavy surfaces / orange skin structure

### ...Explanation

This is a progressive disorder.

### ...Background

The formation of a polymer film does not take place in exactly the same way at every point, rather so-called polymer centers are formed. The different aggregate states then lead to uneven flow behavior, which is further facilitated by temperature fluctuations during curing.

### ...Rework

Sand and degrease the surface, reapply the system, observing the avoidance instructions.

### ...Avoidance

Addition of passive thinners (e.g. Thinner XB) or addition of thixotropic agent (e.g. HP-PK22). Alternatively, the leveling agent HP-BEL71 can be used. CAUTION: Additives cloud the resin system. Keep the temperature constant during curing.

## ! Problem

Surfaces turn white on contact with water.

### ...Explanation

Water is fundamentally incompatible with EP raw materials.

### ...Background

Two types of white coloration are known for epoxy resins:

1. **Water-Spotting** becomes immediately visible on contact with water.
2. **Chalking** is evident in outdoor areas with simultaneous exposure to CO<sup>2</sup> and sunlight.

### ...Rework

**Water-Spotting:** This process is reversible, the white coloration will reappear, e.g. by selectively heating the imperfections with a warm air dryer.

**Chalking:** Sand and degrease the surface, reapply the system, observing the avoidance instructions.

### ...Avoidance

Always allow objects to cure for 7 days (at 20°C) before exposure to water. Cure at higher temperatures and apply additional clear coats if used outdoors.

- Object not permanently exposed to water (e.g. HP-KL400 or HP-PUR )
- Object permanently exposed to water (e.g. HP-PUR-PLUS)

## ! Problem

Epoxy resins turn yellow in direct sunlight or when exposed to heat.

### ...Explanation

UV radiation and heat lead to yellowing in conventional EP systems.

### ...Background

Conventional epoxy resins are based on an aromatic molecular building block. UV rays stimulate radical formation, which leads to yellowing of the objects. Heat (from 50°C) promotes this effect, but heat stress (from 50°C) alone also leads to significant discoloration.

### ...Rework

Once yellowing has occurred, it can no longer be reversed.

### ...Avoidance

Our systems with cycloaliphatic amines (hardeners), which are labeled as low-yellowing, are a good working basis. Our UV stabilizer (e.g. HP-BEL91) has a long-term effect against yellowing, as only part of the additive is used up. When used outdoors, also apply a suitable varnish:

- Object not permanently exposed to water (e.g. HP-KL400 or HP-PUR)
- Object permanently exposed to water (e.g. HP-PUR-PLUS)

## ! Problem

When mixing a 2-component synthetic resin mixture according to specifications, the container in the cup becomes hot.

### ...Explanation

2-component synthetic resin mixtures generally give off heat.

### ...Background

When the chemically functional individual components are brought together, a reaction starts which releases heat into the environment. In unfavorable geometries (high mass, low surface area), a lack of energy dissipation leads to a build-up of heat and the mixture heats up in the mixing vessel. The pot life (processing time) specified by us refers to an ambient temperature of 23°C with a batch size of 100g. Larger quantities and higher temperatures shorten the processing time.

### ...Rework

Material that has become too hot (> 40°C) in the cup can no longer be used.

### ...Avoidance

Pour the mixture into trays or reduce the preparation quantities. Select a system with a longer pot life. Avoid high starting temperatures of the material, store in a cool place (15°C - 20°C) before starting work and keep room temperature low.



## FAQ

### ? Question

**What is the difference between a passive and an active thinner for epoxy resins?**

**Passive thinner** are auxiliary liquids that can be added to the mixed EP system to reduce the viscosity and thus make it easier to apply or roll the compound onto the surface, for example. Passive thinners must evaporate completely and can only be used in small layer thicknesses (less than 1 mm) at a sufficient room temperature (20°C).

**Active thinners** react chemically with the hardener and must be taken into account when calculating the preparation quantities (observe data sheet). Active thinners do not evaporate and can also be used in casting resins and laminating resins. However, it should be noted that there may be a loss of physical properties (lower heat resistance, lower tensile strength).

### ? Question

**Are cured epoxy resins food-safe?**

In principle, there are formulations that are suitable for free testing for food contact, e.g. by the Hygiene Institute Gelsenkirchen. The regulations are subject to EU law and are subject to frequent revision. Please contact us directly regarding the current legal situation. Alternatively, you can also coat objects made from EP systems with saliva-resistant children's toy paint (DIN EN 71-3), in which case short-term contact with food is acceptable.

### ? Question

**Can cured epoxy resin systems be worn on the skin?**

As part of the development of a filled coating resin system, the optimally cured EP system (e.g. bredderpo<sup>x</sup>® E40D / HP-E50GB) was measured as non-cytotoxic (MTS Assay Survival of MRC5 = 98%). The cured system is physiologically harmless when used as jewelry.

### ? Question

**How long can the products be stored?**

The shelf life of the products in unopened condition can be found on the respective product data sheet. Once a bottle has been opened, it is no longer possible to give a general shelf life. The period of use is therefore also heavily dependent on the frequency of removal, so constant removal of a few grams shortens the period of use due to repeated exposure to air.

### ? Question

**Are the vapors from EP resin systems harmful?**

The hazard characteristics of a chemical are communicated by manufacturers via the so-called safety data sheet. Our systems are free of volatile substances at 20°C. It is therefore generally sufficient to ensure good ventilation of the room (open windows) for small quantities (approx. 100g/ 20°C). We recommend wearing a half-mask with an activated carbon filter when using casting resin for larger objects, e.g. when casting large areas of pictures or floors.

### ? Question

**I can't open the bottle caps?**

Child safety locks on bottles are sometimes also „adult-safe“.

It is quite easy to bypass a stiff childproof lock, even if the neck of the bottle is already dented. Use a small pair of pipe wrenches, squeeze the cap slightly while gripping it from above and twist to open the container. The cap does NOT have to be pressed down at the same time. This procedure has always led to successful opening in similar cases. Important! Wipe the threads of the containers with a paper kitchen towel after removal and never mix up the respective closures!

### ? Question

**Can cured synthetic resins be sanded or polished?**

In principle, hard-curing synthetic resin systems can be machined (sanding, drilling, sawing). For sanding and polishing, articles for refreshing car paints from the automotive accessories trade (refreshing car paints) are suitable. Tip: Finely sanded surfaces (>1000 grit) do not need to be polished extensively, our 1K or 2K paints also smooth matt sanded surfaces with considerably less effort.

### ? Question

**How can synthetic resin residues be disposed of?**

Do not allow to enter drains, bodies of water or soil. Uncured product residues are hazardous waste. The hardened system is construction site waste / household waste.

## 18

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18

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# Notes

19

## Our business areas:

**HP-TeXtiles**

Composite materials



**DeinTeich.de**

Teich Pool Dach

GRP coatings



Building chemistry



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