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## Technical Data Sheet

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**Properties:**

AKEPOX® 2005 3+3 Laminating Resin is a liquid, solvent-free, two-component system on the basis of epoxy resin with a modified polyamine hardener.

The product characterized by the following properties:

- very good laminating resin for the production of steps in accordance with the 3+3 method using hewn stone or artificial stone bound by either reaction resin or cement
- certification No. Z-50-1-323 for building use from the German Institute of Structural Engineering
- certification for use in marine applications (MED): module B approval No. 118480-00 and module D certificate No. SEE20035 of German BG for transport and traffic, Ship Safety Division (Notified Body No. 0736)
- extremely little shrinkage during the hardening process. As a result, there is very little tension within the bonding layer
- extremely weather-resistant
- can be easily and very effectively coloured using AKEPOX® colouring pastes or concentrates (not approved for marine applications)
- good thermal stability: approx. 60 - 70°C
- the laminated layer has a good dimensional stability
- low tendency towards fatigue
- very good resistance to alkalis and therefore very suitable for cast stone
- good electrical insulating effect
- good adhesion on slightly damp stone
- no tendency towards crystallization, therefore no storing problems and good processing safety

**Application Area:**

AKEPOX® 2005 3+3 Laminating Resin is mostly used in conjunction with a GRP roving fabric for the manufacturing of steps (treads) for bolt-connected and stringer stairs made of hewn stone or either reaction resin or cement-bound cast stone. Thin bonding seams are possible on account of its low viscosity consistency. This product is not suitable for the bonding of polyolefines (PE, PP), silicones, fluorocarbons (teflon), plasticized PVC, flexible PU or butyl rubber.

AKEPOX® 2005 3+3 Laminating Resin is also used for bonding natural stone to non-combustible surfaces for use as a coating material for bulkheads, walls, cladding and ceilings in shipbuilding.

**Instructions for use for 3+3 steps:**

1. Surfaces to be bonded must be clean (above all free of dust and residues of the sawing and grinding process) and almost dry.
2. Two parts by weight of AKEPOX® 2005 component A are to be mixed with one part by weight of AKEPOX® 2005 component B (e.g. 100 g and 50 g). Alternatively, seven parts by volume of AKEPOX® 2005 component A are to be mixed with four parts by volume of AKEPOX® 2005 component B (e.g. 175 ml and 100 ml) until the mixture is free of streaks and a homogeneous shade of colour is achieved.
3. AKEPOX® colouring pastes or concentrates can be used for colouring if required (max. 5%).
4. The mixture remains workable for approx. 40 to 50 minutes (20°C).

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5. Apply part of the resin mixture to the first stone slab and spread it with a toothed spreader.
6. Lay the roving fabric (weight per sq. meter: approx. 900 g/m<sup>2</sup>) on top and press it down with a laminating roller. Afterwards, apply enough of the resin mixture to soak the fabric well.
7. Any bubbles of air which may be present must be pressed out of the saturated GRP roving fabric using the laminating roller again.
8. Then the second stone is laid on top. Secure the glued parts to protect them from slipping to one side before they have hardened.
9. The laminated slabs can be sawn or further processed in another way after approx. 24 hours (at 20°C). Its maximum strength is reached after 7 days (at 20°C).
10. Tools can be cleaned with AKEMI® Cleaner I.
11. Warmth accelerates and cold retards the hardening process.

### Instructions for use for marine application:

1. Surfaces to be bonded must be clean (above all free of dust and residues of the sawing and grinding process) and almost dry.
2. Two parts by weight of AKEPOX® 2005 component A are to be mixed exclusively with one part by weight of AKEPOX® 2005 component B (e.g. 100 g and 50 g). Alternatively, seven parts by volume of AKEPOX® 2005 component A are to be mixed exclusively with four parts by volume of AKEPOX® 2005 component B (e.g. 175 ml and 100 ml) until the mixture is free of streaks and a homogeneous shade of colour is achieved.
3. The mixture remains workable for approx. 40 to 50 minutes (20°C). After approx. 16 to 24 hours (20°C) the bonding can be loaded. Max. strength after 7 days (20°C).
4. Tools can be cleaned with AKEMI® Cleaner I.
5. Warmth accelerates and cold retards the hardening process.

### Special Notes:

- For professional use only.
- The optimal mechanical and chemical properties can only be attained by adhering to the exact mixing proportions; excess adhesive or hardener has the effect of a plasticizer respectively may result in discolouring of the marginal zones.
- Residues resulting from the grinding or sawing process considerably reduce adhesion.
- Use separate vessels when component A and B are being extracted from their containers.
- The resin mixture must no longer to be used if it has already thickened or is jellying.
- The product is not to be used at temperatures below 10°C because it will not sufficiently harden.
- The hardened resin tends to yellowing when exposed to sunlight.
- The hardened resin can no longer be removed by means of solvents. This can only be achieved mechanically or by applying higher temperatures (> 200°C).
- If the resin has been correctly worked it presents no hazard to health when the hardening process is completed.

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- If used in ship construction, the following instructions given in the certification must be observed:  
The system structure is as follows:
  - a) AKEPOX® 2005  
Mixing ratio (volume) of the 2-component adhesive = 2:1  
(component A : component B);  
wet application rate: 0.5 - 0.6 kg/m<sup>2</sup>
  - b) Natural stone (thickness ≥ 5 mm)  
Total thickness of the system: approx. 5.5 mm  
The system must be processed without joints.  
Colour of AKEPOX® 2005: transparent
- AKEPOX® 2005 is approved as a fire-resisting surface material in accordance with SOLAS 74/88 Reg. II-2/3, II-2/5, II-2/9 and X/3, recent version, IMO Resolution MSC.36(63)-(1994 HSC-Code) 7, IMO Resolution MSC.97(73)-(2000 HSC-Code) 7, IMO MSC/circular 1120.
- The following standards applicable for AKEPOX® 2005 contain all foreseeable risks: (inter alia FTP-Code, council directive 2014/90/EU, commission implementing regulation (EU) 2020/1170, SOLAS 74/88 especially regulation II-2/3, II-2/5, II-2/9 and X/3, latest version, IMO-resolution MSC.36(63)-(1994 HSC-code) 7, IMO resolution MSC.97(73)-(2000 HSC code) 7, IMO MSC/circular 1120).
- Recycling in accordance with the guidelines of EU Decision 97/129 EC on the Packaging Directive 94/62/EC.

A declaration of conformity will be sent to the customer on request, quoting the batch number.

### Technical Data:

- |            |                                |                                |
|------------|--------------------------------|--------------------------------|
| 1.         | <u>Component A:</u>            | <u>Component B:</u>            |
| Colour:    | light yellow                   | light yellow                   |
| Density:   | approx. 1.15 g/cm <sup>3</sup> | approx. 1.01 g/cm <sup>3</sup> |
| Viscosity: | 1700 - 2000 mPas               | 5000 - 6000 mPas               |
2. Working time
    - a) Mixture of 100 g comp. A + 50 g comp. B  
At 10°C: 120 - 150 minutes  
At 20°C: 40 - 50 minutes  
At 30°C: 20 - 25 minutes  
At 40°C: 10 - 13 minutes
    - b) At 20°C and various amounts  
20 g comp. A + 10 g comp. B: 90 - 100 minutes  
50 g comp. A + 25 g comp. B: 50 - 60 minutes  
100 g comp. A + 50 g comp. B: 40 - 50 minutes  
300 g comp. A + 150 g comp. B: 30 - 40 minutes
  3. Hardening process (shore D-hardness) of a 2 mm layer at 20°C:  

<u>4 hrs</u>	<u>5 hrs</u>	<u>6 hrs</u>	<u>7 hrs</u>	<u>8 hrs</u>	<u>9 hrs</u>	<u>24 hrs</u>
-	-	8	15	28	41	82
  4. Mechanical properties  

Bending strength DIN 53452:	100 - 110 N/mm <sup>2</sup>
Tensile strength DIN 53455:	50 - 60 N/mm <sup>2</sup>

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5. Chemical resistance	
Water absorption DIN 53495	< 0.5%
Sodium chloride solution 10%	stable
Salt water	stable
Ammonium 10%	stable
Soda lye 10%	stable
Acetic acid 10%	conditionally stable
Formic acid 10%	conditionally stable
Petrol	stable
Diesel oil	stable
Lubricating oil	stable

**Storage:** If stored in dry and cool condition (5-25°C/41-77°F) in its closed original container at least 24 months from production.

**Health & Safety:** Read Safety Data Sheet before handling or using this product.

**Important Notice:** The above information is based on the latest stage of development and application technology. Due to a multiplicity of different influencing factors, this information – as well as other oral or written technical advises – must be considered as non-binding hints. The user is obliged in each particular case to conduct performance tests, including but not limited to trials of the product, in an inconspicuous area or fabrication of a sample piece.