

Kimitech EP-IN

ST14-0221

Liquid two-component epoxy adhesive for structural injection, vertical downwards and sub-horizontal anchors, impregnation of FRP systems, loaded resin screeds and fillings.



DESCRIPTION

Kimitech EP-IN is a two-component, low viscosity, liquid, epoxy resin with high wetting power. **Kimitech EP-IN** is ideal for impregnating high grammage mesh and tapes and it can easily penetrate cracks and micro-fractures (up to 0,3 mm thick). It has excellent dielectric properties, The product comes in two ready-dosed containers (A+B): a larger quantity of part "A" is provided to facilitate mixing. **Kimitech EP-IN** is CE marked as structural bonding agent in compliance with EN 1504-4 and as anchoring product for steel reinforcement bars according to EN 1504-6. The product is part of Kimia systems which gained the Italian **CIT** n. 392.

ADVANTAGES

- High adesion; high wetting power; low viscosity.
- Suitable for different kinds of work

USES

Impregnation of structural reinforcement meshes using the "Béton Plaqué" technique, injections into damaged structures, vertical downwards and sub-horizontal anchoring. In combination with **Kimifill** it is used to obtain spreadable, epoxy mortars to rebuild lacking parts of wood structures, to build high resistance continuous floorings and repair damaged joints.

WORKS

- Anchoring of rebars on compact structures in reinforced concrete, cotto stones, stones, wood with vertical holes or inclined downward. (**SA3**)
- Waterproofing of structures in contact with highly aggressive chemicals (**SA13**)
- High-thickness industrial floors in epoxy resin (**SA32**)
- Renovation of wood structures with no shape changes at the intradox (**SA57**)
- Restoration of degraded wood beams in connection with masonry (**SA58**)
- Structural reinforcement, bonding and impregna-

tion of carbon fibre mesh (**SA61**)

- Structural reinforcement, bonding and impregnation of glass fibre mesh (**SA62**)
- Renovation and sealing of degraded joints (**SA31**)

APPLICATION

	Manual application		Gun application
	Pourable		Brush or roll application

Information on how to carry out each type of application, please refer to the specifications and technical data sheets of the materials to be used.

Surfaces to be treated must be perfectly dry (newly cast concrete must be left to cure for at least 4 weeks), with no detaching parts, dust, grease, paint or parting compounds of any kind. Pour component "B" (hardener) into component "A" (resin), then mix with a low speed stirrer (200-300 RPM) until an even mixture is formed, making sure not to let air in while mixing. For partial mixtures, respect the proportions by weight (not by volume) indicated on the packs.

Injections into damaged structures

For injections use our dedicated gun **MM/TL** or **AC/TL** or low-pressure pump

Vertical downward and sub-horizontal anchorings

Cleaning the hole with compressed air. After mixing the two components, if the holes are less than 40 cm depth, pour the mixture in and then insert the rod twisting it to get rid of any excess resin in the hole. For holes with a longer length, inject the mixture in using the **MM/TL** or **AC/TL** gun connected to a thin plastic pipe that goes in the hole until it rea-

ches at least half length of the hole, then insert the rod. When creating anchors in mixed masonry structures where substantial dispersion can occur, add **Kimifill VR4** powder to make the product less fluid.

Restoration of missing parts and consolidation of load-bearing wood structures

When consolidating wood structures, mix the resin with extremely fine, dry sawdust; for exposed grouting/filling, mix with **Kimifill HM** quartz in a 1:5 resin-quartz ratio to restore flaking or missing parts (for this jobs please contact our Technical Dept.).

Restoration of concrete floors and preparation of spreadable mortars

Surfaces to be treated must be perfectly dry (newly cast mortar and concrete must be left to cure for at least 2 weeks), with no detaching parts, dust, grease, paint or any sort of releasing agent. Concrete substrates must be preliminary treated with a coat of **Kimicover FIX**. Mix the resin with the hardner and add the **Kimifill HM** quartz in a 1:10 ratio then restore the missing parts of concrete or spread a continuous coating across the entire floor surface. Once the product cured, complete the intervention using **Kimitech** or **Kimicover** resins.

Structural reinforcement using composite systems

Prepare the surface to be treated using as a primer **Kimicover FIX** and once applied the epoxy adhesive **Kimitech EP-TX** or **Kimitech EP-TX/311** (contact our Technical Support Service) then lay the fabric, pressing it down lightly with a suitable metal roller to improve adhesion to the adhesive and to prevent dangerous air bubbles from forming. Apply more than one coat of **Kimitech EP-IN** to the fabric using a brush to enhance overall impregnation. All coats should be applied wet on wet. If more than one reinforcement layer is required, or if the reinforcement needs to be protected, contact our Technical Support Service.

Structural reinforcing systems using the "Béton-Plaque" technique

Sandblast both concrete and steel surfaces where the reinforcing system will be applied to. Concrete substrates must be preliminary treated with a coat of **Kimicover FIX** after the cleaning phase.

Mix the resin carefully and, depending on the viscosity or consistency required, use it as is, or after adding **Kimifill** inert materials.

Creation of adhesive surface (adhesion bridge)

In case of new casting on existing supports, treat preliminary the surfaces with sand-blasting, shot-blasting or milling in order to remove any trace of releasing agent, wax, paint or weak parts.

Pour the new casting on the clean surface just after the application of **Kimitech EP-IN** and **Kimifill** quartz. The sand quartz has to be applied while the resin is still fresh.

Do not pour the new casting on the hardened resin, always pour the new material while the resin is still fresh

Pay attention if the treated surfaces are exposed to the sun and if the application is performed during windy and very warm days: all these factors can sharply reduce the drying time of the resin.

CONSUMPTION

Fabric impregnation → 0,8-1,5 Kg /m²

Filling and embedding → 1 Kg/dm³

Adhesion bridge → 0,7-1,2 kg/m² depending on the roughness of the support

PACKAGING

- Com Kg 6 (A: 4 Kg + B: 2 Kg)
- Com Kg 18 (A: 12 Kg +B: 6 Kg)

STORAGE

Stored in a sealed container in a dry place, the product will remain stable for 24 months.

Characteristics	Typical data
Freezing time (200 g at 25°C)	25 mins
Total curing at 25°C	7 days
Colour	Transparent
Viscosity (poises at 25°C)	8 - 10 (A+B)
Dry residue (A+B) UNI 8309	> 98 %
Compressive strength at 7 dd ASTM D695-02a	> 50 MPa
Max tensile strength ASTM D 638	> 30 MPa
Tensile tangent modulus ASTM D 638	1760 MPa

Characteristics	EN 1504-4 limits "Restoring method 4.3 Reinforcing with adhesive plate"	Typical data
Elastic modulus in compression [MPa] EN 13412	≥ 2000	3406
Workability time EN ISO 9514	Declared value	Workability at 20°C: 30 minutes In 15 mins = 3,4 MPa In 30 mins = 3,2 MPa In 45 mins = 1,8 MPa
Thermal expansion coefficient [µm/m°C] EN 1770	≤ 100	98,5
Glass transition temperature [°C] EN 12614	≥ 40	43,7
Total shrinkage for structural adhesive agents EN 12617-1	≤ 0,1 %	0,06 %
Steel-steel adhesion [MPa] EN 12188	Shear	Shear
	50° 60° 70°	50° 60° 70°
	≥ 50 ≥ 60 ≥ 70	65,3 85,6 119,1
	Traction	Traction
	≥ 14	18,3
Open time EN 12189	Declared value ±20%	Ok
Durability EN 13733	Specimens must not break due to thermal	Ok

	cycles or hot-humid	
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Characteristics	EN 1504-4 limits "Restoring method 4.3 Reinforcing with adherent plate"	Typical data
Shear resistance [MPa] EN 12615	≥ 6	3406

Impregnation resin	Kimitech EP-IN
Type of resin	Epoxy
Density (g/cm ³)	1,08 ± 0,05 g/cm ³
Catalysis ratio by weight	A:B=2:1
Elastic modulus on compression [Mpa] EN 13412	3406
Pot Life at 10 °C (min)) measured as workability time EN ISO 9514	At 0 min = 3,6 Mpa; At 15 mins = 3,6 Mpa; At 30 mins = 3,6 MPa
Pot Life at 20 °C (min)) measured as workability time EN ISO 9514	At 15 mins = 3,4 Mpa; At 30 mins = 3,2 MPa At 45 mins = 1,8 MPa
Pot Life at 35 °C (min)) measured as workability time EN ISO 9514	At 0 min = 3,7 Mpa; At 5 mins = 3,6 Mpa
Suggested application temperatures range	10 °C – 35 °C
Thermal expansion coefficient [µm/m°C] EN 1770	98,5
Glass transition temperature [°C] EN 12614	43,7
Total shrinkage for structural adhesive agents EN 12617-1	0,06 %

Characteristics	EN 1504-6 limits "Steel reinforcement bars anchoring"	Typical data
Pull-out resistance of steel rods – movement under a load of 75 kN [mm] EN 1881	≤ 0,6	OK
Creep movement with a load of 50 kN for 3 months [mm] EN 1544	≤ 0,6	OK
Glass transition temperature [°C] EN 12614	≥ 40	43,7
Reaction to fire	Euroclass	F
Chloride ion content	≤ 0,05%	OK

VARIANTS

The product is available in two versions:

- less fluid (**Kimitech EP-IN/CMP**);
- more rapid (**Kimitech EP-IN/50**).

WARNING

Product intended for professional use.

Do not apply the product with imminent rain forecast.

The equipment used for the preparation and laying of the product must be cleaned with **Solvente EPOX** before hardening.

Handle with care: use gloves, protective creams and goggles to avoid contact with skin and eyes.

Any **Kimifill** quartz aggregates or sawdust added to the product must be perfectly dry.

For further information and advice on safe handling, storage and disposal of chemical products, the user must refer to the most recent Safety Data Sheet, containing physical, ecological, toxicological and other data related to safety. All technical data shown in this Technical Data Sheet are based on laboratory tests. Actual measurement data may vary due to circumstances beyond our control. The information and requirements indicated in this Technical Data Sheet are based on our current knowledge and experience and are to be considered, in any case, purely indicative.

They cannot guarantee the final result of the applied product and they have to be confirmed by exhaustive practical applications; therefore the user must test the suitability of the product for the intended application and its purpose.

Users must always refer to the latest version of the local technical data sheet related to the product.

VOCI DI CAPITOLATO

SK3 - Anchoring of rebars on compact structures in reinforced concrete, cotto stones, stones, wood with vertical holes or inclined downward.

SK13 - Waterproofing of works intended for contact with strong chemical agents

SK31 - Renovation and sealing of degraded joints

SK32 - High-thickness industrial floors in epoxy resin

(**SK3**) Anchoring of reinforcements on compact structures in reinforced concrete, terracotta, stone, wood, with vertical holes or inclined downwards after drilling with suitable equipment and cleaning with jets of compressed air, insertion into the holes of metal or synthetic reinforcements or synthetic and anchoring by injection of solvent-free two-component fluid epoxy resin with low viscosity Kimitech EP-IN by Kimia SpA or similar product.

(**SK13**) Cleaning (aimed at the total elimination of dust, grease, old varnishes, inconsistent parts, in detachment, without sufficient mechanical characteristics and any other material that could affect the good anchoring) and cortical restoration/smoothing of the substrate, Preliminary treatment of joints and fittings and waterproofing with Betonfix 300 mortar (consumption of about 3.5 Kg/m²) mixed at 35% by weight with Kimitech ELASTOFIX. by Kimia S.p.A. or similar product, reinforced with Kimitech 350 mesh.

Once the mortar has cured and in any case not before 7 days, apply by brush or roller the water-based two-component epoxy primer Kimicover FIX (consumption of about 0.3 Kg/sq.m) and finishing with a double layer with fiber mat glass mesh Kimitech S100 impregnated with two-component epoxy resin Kimitech EP-IN (total consumption of about 2.5 Kg/sqm) by Kimia SpA or similar products.

(**SK31**) Demolition of all the inconsistent material to find the compact concrete. Cleaning of the substrate aimed at the total elimination of dust, grease, old friable varnishes and any material that could affect the good anchoring of the resin. Application on the surface to be treated of two-

component consolidating resin in aqueous dispersion Kimicover FIX or similar with a minimum consumption of 0.3 kg/sqm.

Joint reconstruction with Kimitech EP-IN epoxy resin filled with spheroidal quartz aggregates Kimifill HM by Kimia S.p.A. or similar products.

Sealing with:

- A) Tecnoseal 88 two-component self-leveling sealant;
- B) Sealant in cartridge Tecnoseal 130.

(SK32) Realization of reinforced floors with high thickness after proper preparation of the substrate, pre-priming with Kimicover FIX by Kimia S.p.A. or similar product and application of Kimitech EP-IN epoxy resin loaded with spheroidal quartz aggregates Kimifill HM by Kimia S.p.A. or similar products.

Solvent-free, low-viscosity, two-component fluid epoxy resin will be prepared and applied following the instructions on the technical data sheets provided by the manufacturer and must have the following characteristics:

- Frost time (200 g at 25°C): 25 mins;
- Complete hardening at 25°C: 7 days;
- Viscosity (poises at 25°C): 8 - 10 (A+B);
- Dry residue (A+B) UNI 8309: > 98 %;
- Compressive strength at 7 days ASTM D695-02a: > 50 Mpa;
- Max tensile strength ASTM D 638: > 30 MPa;
- Tensile tangent modulus ASTM D 638: 1760 Mpa.

The product will be tested by notified external laboratories as for tensile strength and modulus of elasticity.

The product will be CE marked as structural bonding according to EN 1504-4.

SK57 - Renovation of wood structures with no shape changes at the intradox

SK58 - Restoration of degraded wood beams in connection with masonry

Shoring of the structure, with removal of all the materials found in the intervention areas.

Anti-mold and anti-mold treatment on all wooden parts, after careful removal of dust, greasy substances and all materials that may compromise a perfect anchoring of the resin.

(SK57) Verification and static design of the existing stresses.

Execution (at the extrados of the wooden beam) of a section opening suitable for the realization of a new collaborating beam that can support the loads.

(SK58) Demolition of the masonry in correspondence with the substrate of the wooden beam and elimination of the damaged parts of the wooden beam. Perforation of the head of the wood and accurate blowing of the perforations in order to eliminate any possible residual of inconsistent materials that could compromise the adhesion to the wood.

Insertion and grouting of nr. 4 bars with full circular section and very high resistance to corrosion Kimitech TONDO VR by Kimia S.p.A. or similar product.

For the epoxy casting, use Kimitech EP-IN resin by Kimia S.p.A. or similar product loaded 1 to 5 with proper aggregates.

Once hardened, restore the previously removed materials and eliminate any shoring.

Solvent-free, low-viscosity, two-component fluid epoxy resin will be prepared and applied following the instructions on the technical data sheets provided by the manufacturer and must have the following characteristics:

- Frost time (200 g at 25°C): 25 mins;
- Complete hardening at 25°C: 7 days;
- Viscosity (poises at 25°C): 8 - 10 (A+B);
- Dry residue (A+B) UNI 8309: > 98 %;
- Compressive strength at 7 days ASTM D695-02a: > 50 Mpa;
- Max tensile strength ASTM D 638: > 30 MPa;
- Tensile tangent modulus ASTM D 638: 1760 Mpa.

The product will be tested by notified external laboratories as for tensile strength and modulus of elasticity.

The product will be CE marked as structural bonding according to EN 1504-4.

SK61 - Structural reinforcement, bonding and impregnation of carbon fibre mesh

SK62 - Structural reinforcement, bonding and impregnation of glass fibre mesh

Shoring of the structures involved in the intervention.

Cleaning of the substrate with total elimination of inconsistent parts and of any material that could affect the good anchoring. Rounding of any edges (minimum radius of 2 cm). Accurate grouting of any cracks or microcracks to be carried out with suitable mortars. If the surface of the reinforcement is very irregular, it will be smoothed with suitable hydraulic mortars.

Kimicover FIX resin by Kimia S.p.A. will be used as primer. or similar product with a minimum consumption of:

0,2 Kg/m² (in case of concrete or wooden substrates)

0,3 Kg/m² (in case of masonry substrates)

0,5 Kg/m² (in case of chalk or reed substrate)

The thixotropic two-component epoxy adhesive will be Kimitech EP-TX resin by Kimia S.p.A. or similar product. Minimum consumption of:

- 3.5 kg/sqm on an irregular substrate;

- 3 Kg/mq on wooden substrate;

- 2-2,5 Kg/mq on substrate regularised with Tectoria M15 or Betonfix FB;

- 1,6-2 Kg/mq on a smooth substrate in r.c. or steel.

(SK61) The carbon reinforcement mesh will be Kimitech CB or Kimitech CBA by Kimia S.p.A. or similar product.

(SK62) The fiberglass reinforcement mesh will be the Kimitech XX (insert the commercial name of the chosen mesh) by Kimia S.p.A. or similar product.

The two-component fluid resin used for the impregnation will be Kimitech EP-IN by Kimia S.p.A. or similar product.

Consumption will vary according to the weight and type of the mesh.

For the anchors, Kimitech FRP-LOCK connectors by Kimia S.p.A. or similar products

Solvent-free, low-viscosity, two-component fluid epoxy resin will be prepared and applied following the instructions on the technical data sheets provided by the manufacturer and must have the following characteristics:

- Tempo di gelo (200 days at 25°C): 25 mins;
- Complete hardening at 25°C: 7 days;
- Viscosity (poises at 25°C): 8 - 10 (A+B);
- Dry residue (A+B) UNI 8309: > 98 %;
- Compressive strength at 7 days ASTM D695-02a: > 50 Mpa;
- Max tensile strength ASTM D 638: > 30 MPa;
- Tensile tangent modulus ASTM D 638: 1760 Mpa.

(SK62) The product will be tested by notified external laboratories as for tensile strength and modulus of elasticity.

The product will be CE marked as structural bonding according to EN 1504-4.

(SK61) The reinforcement system made with Kimitech CB or Kimitech CBA reinforcement fabrics will be in possession of Italian CIT, point 11.1, case C, of the NTC 2008, according to the qualification procedures of the reinforcement systems made in situ at point 5.2 of the " Guideline for the identification, qualification and acceptance control of fiber-reinforced polymeric matrix composites (FRP) to be used for the structural consolidation of existing buildings ".

The product will be CE marked as structural bonding according to EN 1504-4.