

CARBOFIX ADHESIVE



10

BETOSAN® BETOSAN® CRC reinforcement system

Thixotropic epoxy adhesive – part of BETOSAN® CRC reinforcement system

1. Product characteristics

CARBOFIX ADHESIVE is a specially formulated two-component solvent-free thixotropic epoxy adhesive

- supplied in specified ratio of each component; no weighting in-situ is needed
- shows perfect mechanical properties under both low and high temperatures
- permanently resistant to effects of aggressive acidic and alkaline medias, oils, oil products, etc.
- hardens without shrinkage
- meets the requirements of EN 1504-4

2. Use

CARBOFIX ADHESIVE is a specially formulated two-component thixotropic adhesive based on epoxy resin, used especially for bonding carbon strips (**BETOSAN® CRC UPL**) to reinforced concrete, steel, wood and other substrates. A typical example of use is for the application of carbon strips on ceiling or vertical surfaces, and on the lower parts of beams, where excellent adhesion to the substrate is necessary to achieve maximum strength of the resulting joint. Similarly, on walls and on any surfaces where the bonding of the carbon strip to the substrate is a critical parameter. **CARBOFIX ADHESIVE** is also used for hard and rigid jointing of concrete, panels, concrete-steel or wood joints. It is also used as a thixotropic mortar for repairing and reinforcing structures. The **CARBOFIX ADHESIVE HM** variant has an increased glass transition temperature and an increased modulus of elasticity.

3. Physical and mechanical parameters

Requirements / results according to EN 1504-4

| | Testing method | Requirement | Result |
|---|----------------|--|--|
| Adhesion to concrete (N/mm ²) | EN 12188 | tensile stress ≥ 14 shear angle at 50° ≥ 50 shear angle at 60° ≥ 60 shear angle at 70° ≥ 70 | tensile stress ≥ 14 shear angle at 50° ≥ 50 shear angle at 60° ≥ 60 shear angle at 70° ≥ 70 |
| Shear strength (N/mm ²) | EN 12188 | ≥ 12 | ≥ 12 |
| Total shrinkage | EN 12617-1 | $\leq 0.1 \%$ | $\leq 0.1 \%$ |
| Workability/Pot life (min) | EN ISO 9514 | - | 30 |
| Compressive elasticity modulus (N/mm ²) | EN 13412 | $\geq 2\,000$ | 2 000 (8 600*) |
| Coefficient of thermal expansion (K ⁻¹) | EN 1770 | $\leq 100 \cdot 10^{-6}$ | $\leq 100 \cdot 10^{-6}$ |
| Glass transition temperature | EN 12614 | ≥ 40 | 45 (55*) |

* **CARBOFIX ADHESIVE HM** variant

Characteristic properties of the uncured composition

| | |
|------------------------|--|
| Color | component A – grey, component B-light grey |
| Workability/Pot life | 30+40 minutes at 20 °C |
| Mixing ratio by weight | 4:1 |

Characteristic properties of the cured composition

| | |
|--------------------------------|-----|
| Tensile strength (MPa) | >80 |
| Tensile bending strength (MPa) | >55 |

The glass transition temperature is used for the design of the fire facing.

4. Test certificates

Meets the requirements of EN 1504-4.

The product is certified according to the Regulation (EU) No 305/2011 of the European Parliament and of the Council (CPR).

Continuous independent quality control is carried out by AZL 1687 LABBET®.

Supervision of the quality system, EMS and OHSAS is carried out by Notified Body No. 3029.

5. Instruction for preparation and application

The adhesive is prepared by proper mixing of components A and B in specified ratio. The mixing ratio is the following:

BETOSAN s.r.o. – repair and special materials for construction

EN ISO 9001; EN ISO 14001; ISO 45001

| CARBOFIX ADHESIVE | component A (weight parts) | component B (weight parts) |
|----------------------|-------------------------------|-------------------------------|
| | 4 | 1 |

Component A is perfectly homogenized, and then components A and B are mixed in a sufficiently large container, respectively. in an original paired package with an electrically driven low-speed propeller stirrer with a speed between 400 - 600 rpm for 3 ÷ 5 minutes. Excessive mixing shortens the pot life. **DO NOT THIN** the product, thinners prevent proper curing.

Workability/pot life: Workability of prepared composition is 30 - 40 minutes at temperatures between 20 °C and 30 °C. At lower temperatures, workability increases, and vice versa higher temperatures significantly shorten the pot life.

Neither temperature of the base nor temperature of ambient air shall be below +8 °C. The composition must be applied at least 3 °C above the dew point.

The adhesive is spread on the substrate with a spatula or trowel. Tools can be cleaned with the **BETOFIL R** agent.

6. Specific consumption

Specific consumption of **CARBOFIX ADHESIVE** is 800 - 2000 g/m², i.e. 5.6 - 14 m² per set (12 kg) with a layer thickness of 1 mm. When bonding **BETOSAN® CRC** carbon strips, the specific consumption is approximately 0.1 kg/m of carbon strip of 50 mm width and 0.2 kg/m of carbon strip of 100 mm width at 1 mm layer thickness. Consumption depends on the surface roughness of the bonded materials.

7. Packing and storage

CARBOFIX ADHESIVE is supplied in sets of 5 kg (4 + 1 kg) or in sets of 12 kg (9.6 + 2.4 kg). Shelf life in original undamaged packing is 12 months. Store at temperatures +5°C to +30 °C. Store in a cool place, but protect against freezing. Containers of both components must be tightly closed. During storage and handling it is necessary to take into account that it is a flammable material of IV. class.

8. Health protection at work

Work with a two-component system **CARBOFIX ADHESIVE** requires adequate sanitary measures usual for work with materials on the epoxy basis. By consistent use of protective equipment during mixing and application workers must avoid direct contact of the composition or its components with the skin and eyes. In case of eye contamination it is necessary to rinse out eyes with clean water for at least 15 minutes and immediately seek out medical aid. In case of afflicted skin it is necessary to wash thoroughly the irritated skin with warm water. Detailed data on safe handling and health protection can be found in the safety data sheets of the individual products

CARBOFIX ADHESIVE is a flammable material of the IV. Class.

Issued MSDS meets the requirements of EC-Regulation 1907/2006, Article 31.

Because the product meets the criteria for classification as hazardous, it is necessary to provide the recipient or carriers with MSDS.

In countries where regulation REACH (par. 33.1): EU regulation on chemicals and their safe use (REACH: EC 1907/2006) is valid, professional users and distributors must be provided with following information automatically and without request:

This product is subject to Regulation (EC) no. 1907/2006 (REACH). It does not contain any substances that could be released from product under normal or reasonably foreseeable conditions of use. Therefore, there are no registration requirements for substances in articles within the meaning of. Article 7.1 of the Regulation.

Based on our current knowledge, this product does not contain SVHC (substances of very high concern) from candidate list published by the European Chemicals Agency in concentrations above 0.1% (w / w).

9. Waste disposal


During disposal of contaminated packages or clearing debris from product, it is necessary to follow the Act No. 185/2001 Coll. on waste, as amended.

10. Important notice

All information mentioned above, especially advice for processing and application of our products, is based on our knowledge from the development of chemical products and on years of experience with applications in practice at standard conditions, and proper storage and use. Due to the differing conditions during processing, high count of products, varying nature and modifications of base and other external influences, the procedure based on the information provided or on other written or oral recommendations, may not always ensure satisfactory working results. BETOSAN s.r.o. assumes no liability for provided advice or recommendation. The applicator must prove that he submitted complete information on time and in writing which is necessary for a proper detailed assessment by BETOSAN s.r.o. The applicator must test the suitability of the products for the intended application. Proprietary rights of third parties, above all, must be taken into account. All received orders are subject to our current "General sales and delivery conditions". Please always make sure that you follow the most recent issue of the Technical Data Sheet. It is available, along with other information, at our Technical Department or at www.betosan.cz.



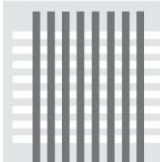
11. CE marking

| | |
|---|---|
|  1301 | |
| BETOSAN s.r.o. Na Dolinách 28, 147 00 Prague 4 | |
| 07 | |
| 10-2/072013 | |
| EN 1504-4 | |
| CARBOFIX ADHESIVE Epoxy adhesive for bonding external reinforcement | |
| Adhesion to concrete | Tensile stress $\geq 14 \text{ N/mm}^2$ Shear angle at $50^\circ \geq 50 \text{ N/mm}^2$ Shear angle at $60^\circ \geq 60 \text{ N/mm}^2$ Shear angle at $70^\circ \geq 70 \text{ N/mm}^2$ |
| Shear strength | $\geq 12 \text{ N/mm}^2$ |
| Total shrinkage | $\leq 0.1 \%$ |
| Workability/Pot life | 30 min |
| Compressive elasticity modulus | $2\,000 \text{ N/mm}^2$ ($8\,600 \text{ N/mm}^2$ *) |
| Coefficient of thermal expansion | $\leq 100 \cdot 10^{-6} \text{ K}^{-1}$ |
| Glass transition temperature | $45 \text{ }^\circ\text{C}$ ($55 \text{ }^\circ\text{C}$ *) |
| Reaction to fire | euro class F |
| Durability (when bonding steel plates) | NPD |
| Hazardous substances | meets 5.4 |

* CARBOFIX ADHESIVE HM variant

8 547 002 387
 Technical Data Sheet No. 10-2
 Issued 20.2.2020

BETOSAN s.r.o., Na Dolinách 28, 147 00 Prague, Czech Republic
 Business-technical office: Nová cesta 291/40, 140 00 Praha 4, Czech Republic
 Tel./fax.:+420 241 431 212, tel.:+420 241 431 215
 E-mail: praha@betosan.cz, www.betosan.cz



10

BETOSAN® BETOSAN® CRC reinforcement system