DRIZORO® Construction Products

MAXEPOX® CARBOFIX

STRUCTURAL ADHESIVE FOR CARBON FIBBER–BASED STRENGTHENING SYSTEMS

CE

DESCRIPTION

MAXEPOX® ***CARBOFIX*** is a two-component, 100% solids –solvent free- epoxy-based structural adhesive, which has been specially designed for bonding of carbon fibre laminate ***DRIZORO®*** ***COMPOSITE*** (Technical Bulletin No. 288) and carbon fibre rod ***DRIZORO® CARBOROD*** (Technical Bulletin No. 289) to structures.
It complies with the requirements of Standards UNE-EN 1504-4 for structural adhesion.

APPLICATION FIELDS

- Structural adhesive of carbon fibre laminate ***DRIZORO®*** ***COMPOSITE*** for strengthening concrete, metal and wood structures, in all kind of civil works and residential building.
- Structural adhesive for fixing of carbon fibre rods ***DRIZORO®*** ***CARBOROD*** on concrete and masonry.
- Structural bonding of steel plates for strengthening concrete structures.

ADVANTAGES

- Excellent adhesion to concrete, metal, wood and composite surfaces. No special primers requiered.
- High mechanical properties.
- Very good thixotropic properties. Suitable for vertical and overhead applications.
- Very good resistance to chemical agents such as salts, diluted acids and alkalises.
- Solvent-free, non-flammable and easy to apply. Suitable for poor ventilated areas.

APPLICATION INSTRUCTIONS

Substrate preparation
Surface to be bonded must be structurally sound and clean, free of dust, coatings, efflorescences, oil, grease, gypsum, or any foreign material that could affect to adhesion. Substrate should be provided with a slight roughness and must be dry. There must be no rising damp due to capillarity. Surface moisture must be less than 4 %.

The surface tensile strength of the concrete or cement mortar substrate must exceed a value of 1.5 N/mm².

Prepare substrate according to instructions given in the Technical Bulletins of ***DRIZORO®*** ***COMPOSITE*** and ***DRIZORO®*** ***CARBOROD.***

Mixing
MAXEPOX® ***CARBOFIX*** is supplied as a pre-weighed two component set. The hardener, component B, is poured into the main component A. In order to ensure the proper reaction between both components, make sure that all of component B is added. Mix mechanically using a slow speed drill (300-400 rpm) until achieving a homogeneous product in colour and appearance. Do not mix for prolonged period nor use high-speed mixer, which may heat the mixture or introduce air bubbles.

Check the technical data table for the pot-life or time it takes the product to harden inside the container. The pot-life for a 5 kg set at 20°C is 30 minutes, reducing with higher temperatures or mixing bigger quantities.

Application
On the suitably prepared ***DRIZORO® COMPOSITE*** carbon fibre laminate, apply a layer of ***MAXEPOX® CARBOFIX*** adhesive 1 to 3 mm thick and spread with a curved spatula so that the adhesive is thicker in the centre and thinner towards the sides. Likewise, apply a layer with the same characteristics to the surface where the laminate is to be bonded.

Place ***DRIZORO® COMPOSITE*** in position within the open time of the adhesive and press the laminate with a solid hard rubber roller until the adhesive overflows at the sides, ensuring total saturation between the contact surface of ***DRIZORO® COMPOSITE*** and the substrate, and that no air pockets remain trapped. Then remove the excess adhesive with a spatula.

Application conditions

The ideal working temperature for surface and ambient is between 10°C and 35°C. Do not apply with temperature below 10°C or if lower temperature is expected within the first 24 hours.

Temperatures above 35°C increase the reaction speed and production of heat and reduce greatly the workability time for application. In this case, before applying the system, store products at temperatures between 15°C to 20°C and plan previously the works.

Surface and ambient temperature must be at least 3°C higher than dew point. Do not apply with R.H. higher than 85 %. With low temperatures, high humidity levels or both, use dry and warm air in order to get the suitable conditions, such as with an electric powered air blower system.

Do not apply if rain, condensation, dew or water contact is expected 24 hours after application and protect the application against contact with water until the total curing of the material.

Curing

Complete cure for ***MAXEPOX® CARBOFIX*** is achieved after 7 days at 20°C and 50 % R.H. Minimum temperature during the full curing time must be higher than 10°C. Applications carried out at lower temperatures, high humidity and/or poor ventilation require longer drying and curing times. Do not allow to bear loads before full curing time.

Cleaning

All tools and equipments can be cleaned with ***MAXEPOX® SOLVENT*** immediately after use. Once the product cures, it can only be removed by mechanical methods.

CONSUMPTION

Estimated consumption of ***MAXEPOX® CARBOFIX*** is 1,8 kg/m^2 per mm thickness, i.e. 0,55 kg per litre of volume to be filled.

Consult Technical Bulletins of ***DRIZORO® COMPOSITE*** and ***DRIZORO® COMPOSITE*** for further information.

These figures may vary depending on the roughness, surface conditions and the application method. A preliminary test on-site will determine the consumption exactly.

IMPORTANT INDICATIONS

- Surface moisture content of substrate must not exceed 4 %. Do not apply on substrates subject to rising humidity or negative water pressure.
- Allow new concrete and mortar to cure a minimum of 28 days before applying ***MAXEPOX® CARBOFIX***.
- The surface tensile strength of the concrete or cement mortar substrate must be greater than 1.5 N/mm².
- Avoid water contact, damp, dew, condensation, etc for at least 24 hours after application.
- Relative humidity must not exceed 85 %.
- Do not exceed the maximum thickness recommended per layer.
- For interior use only.
- Do not add solvent, water or any other non-specified compound to ***MAXEPOX® CARBOFIX***.
- For further information and other uses not specified in this Technical Bulletin consult our Technical Department.

PACKAGING

MAXEPOX® CARBOFIX is supplied in two components pre-weighed sets of 5 and 15 kg set respectively.

STORAGE

Component A and component B, twelve months in its original unopened packaging, in a dry and covered place protected from humidity, frost and direct sunlight, with temperatures between 5 and 30°C. Temperatures below 5°C may lead the crystallisation of component A and B. Should this happen, it must be heated slowly between 80-90°C while it is regularly stirred until achieving its homogeneous and original lump-free appearance.

SAFETY AND HEALTH

MAXEPOX® CARBOFIX is not a toxic product, but skin and eye contact must be avoided. When mixing and applying, do not work without the protection of rubber gloves and safety goggles. In case of eye contact, rinse immediately with clean water but do not rub. In case of skin contact, wash affected area with abundant water and soap. If irritation persists, seek medical assistance.

Do not inhale vapours from heating or burning. Observe the usual precautions for the handling and the application of this type of products.

For further information, Safety Data Sheet of ***MAXEPOX® CARBOFIX*** is available by request.

Disposal of the product and its empty containers must be made by the final user and according to official regulations.

MAXEPOX® CARBOFIX

TECHNICAL DATA

Characteristics of the product		
CE Marking, EN 1504-4 Description: Two-component, epoxy based bonding agent. Principles/Methods. Structural strengthening by plate bonding (Principle 4-SS/4.3),		
Appearance and colour for component A		White homogeneous paste
Appearance and colour for component B		Black homogeneous paste
Appearance and colour for A+B mixture		Grey homogeneous paste
A:B mixing ratio (by weight)		2:1
A+B mixture solid content, (% by weight)		100
A+B mixture density at 20°C (g/cm^3)		1,74 ± 0,1
Application and curing conditions		
Application conditions, T(°C) / R.H. (%)	> 10 / < 85	
Pot life ISO 9514 (min) - 23°C - 35°C	 30 20	
Drying-time to touch at 20°C depending on application thickness, (hours)	5 - 8	
Total curing time at 20°C, (days)	7	
Characteristics for cured product		
Compressive strength at 7 days and 20°C, (MPa)	80	
Modulus of elasticity, EN 13142 (MPa)	> 2000	
Thermal expansion coefficient, UNE EN 1770 (µm/m ºC)	51,2	
Linear shrinkage, UNE EN 12617-1 (%)	0,02	
Glass transition temperature, UNE EN 12614 (°C)	>40	
Adhesion, UNE EN 1542 (N/mm²) - 23°C - 35°C	 2,7 2,3	
Adhesion steel-steel UNE-EN 12188 N/mm^2)	>14	
Shear strength σ_0 UNE-EN 12188 (N/mm²) - 50º - 60º - 70º	 >50 >60 >70	
Flexural strength at 7 days and 20°C, (MPa)	60	
Tensile strength at 7 days and 20°C, (MPa)	30	
Elongation at break at 7 days and 20°C, (%)	0,39	
Compressive modulus at 7 days and 20°C, (MPa)	4.450	
Flexural modulus at 7 days and 20°C, (MPa)	7.750	
Water absorption, (%, by weight)	0,08	
Shore D hardness	80	
Determination of the open time, UNE EN 12189	Breaking load for flexural at 7 days	
	23°C	35°C
- 15 min	7650 (cohesive break in concrete)	7560 (cohesive break in concrete)
- 30 min	7260 (cohesive break in concrete)	6520 (cohesive break in concrete)
- 45 min	7120 (cohesive break in concrete)	4750 (interface break)
- 60 min	4560 (interface break)	-
- 75 min	-	-
- 90 min	-	-
- 105 min	-	-
Durability of structural bonding agents, UNE EN 13733 Steel – Steel - After 50 thermal cycles - After 6 months in hot-wet environment Hardened concrete – Hardened concrete - After 50 thermal cycles - After 6 months in hot-wet environment Hardened concrete – Fresh concrete - After 50 thermal cycles - After 6 months in hot-wet environment	 PASS PASS PASS PASS PASS PASS	
Consumption* / Thickness		
Maximum thickness per application, (mm)	30	
Estimated consumption per mm thickness, (kg/m^2)	1,8	

(*) These figures may vary depending on roughness, surface conditions and application method. A preliminary test on-site will determine the coverage exactly.

GUARANTEE

The information contained in this leaflet is based on our experience and technical knowledge, obtained through laboratory testing and from bibliographic material. ***DRIZORO®, S.A.U.*** reserves the right to introduce changes without prior notice. Any use of this data beyond the purposes expressly specified in the leaflet will not be the Company's responsibility unless authorised by us. We shall not accept responsibility exceeding the value of the purchased product. The data shown on consumptions, measurement and yields are for guidance only and based on our experience. The data is subject to variation due to the specific atmospheric and jobsite conditions so reasonable variations from the data may be experienced. In order to know the real data, a test on the jobsite must be done, and to be carried out under the client responsibility. We shall not accept responsibility exceeding the value of the purchased product. For any other doubt, consult our Technical Department. This version of bulletin replaces the previous one.

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