

S&P Resin 220 epoxy adhesive

Two-component epoxy resin-based adhesive for S&P FRP Systems

01/08

Areas of application

- pressure-bonding
- S&P laminates CFK on concrete and steel

Product description

S&P Resin 220 epoxy adhesive is a solvent-free, thixotropic, grey two-component epoxy resin adhesive that has been specially developed for bonding carbon fibre laminates (S&P laminates CFK). The material characteristics of the fresh and hardened adhesive are designed specifically to satisfy the special requirements of the S&P structural component reinforcement system. The adhesive has been system-tested as a compound for the FRP Lamella dimensioning software.

Advantages

- ready-to-use (no need to add filler)
- convenient pot life
- high adhesive strength and bond strength
- thixotropic, so does not run or drip
- bonds to damp substrates
- high mechanical strength
- hardens with minimum shrinkage
- solvent-free

Substrate preparation

Reinforcement may only take place if the substrate for the laminates CFK has an inherent tensile strength of at least 1.5 N/mm². The substrate must be free from substances which may impair adhesion (oil, grease, wax, etc.), and must additionally be dust-free, clean, more or less dry and sound. Max. substrate humidity: 4 %

Age of concrete depending on climate: at least 3 to 6 weeks.

Important points

When reinforcing structural components with the S&P FRP System, it must be possible to transmit the tensile forces from the laminates to the load-bearing substrate through the adhesive.

Mechanical processing (cleaning) of the substrate is therefore always essential. The usual methods, such as grinding, milling, sandblasting, etc, may be used. Any unevenness in the substrate must be eliminated before the laminates CFK are fitted. This operation is essential to prevent any deflection forces arising under tension. Variation in level must not exceed 0.5 cm over a length of 200 cm. Suitable material: S&P Resin 230 levelling mortar.

Application

Mixing:

Stir the individual components separately and then add component A to component B and mix thoroughly until the colour is uniformly grey and free of any streaks. Place the mixed material in a different container in order to reveal any inadequacies in the mix. Mix slowly to minimise air inclusions.

Mixing ratio:

Comp. A : Comp. B = 4 : 1 by weight and volume

Pot life approx. 60 minutes at +20 °C

Before the adhesive is applied, the surface of the laminate must be cleaned with a cloth soaked in S&P Cleaner. Where appropriate, first apply a layer of adhesive onto the substrate with a spatula to a thickness of approx. 1 mm.

Apply adhesive uniformly onto the laminate in a "roof" shape in a layer approx. 2 mm thick.

Within the time the adhesive remains workable, press the laminate into the layer of adhesive previously applied and bed it in uniformly with a pressure roller until adhesive is pressed out of the joint on both sides. Residual minimum adhesive thickness: 1 mm, maximum thickness: 3 mm.

Important points

Adhesive is best applied to the laminate using a special gluing set.

After the adhesive has hardened, check for bonding over the entire area by tapping.

Fire protection requirements must be complied with, as epoxy adhesives generally have limited temperature resistance.

The surface of the laminates may be painted over to ensure visual uniformity.

Cleaning

Material which has not yet hardened can be washed off with S&P Cleaner. Material which has hardened can be removed only by mechanical means.

Safety instructions

Please refer to the safety, hazard and disposal instructions in the safety data sheet and on the container label.

Consumption

Approx. 1.75 kg/m²/mm

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Technical data

Form	Paste	Comp. A and B	
Colour	light grey black	Comp. A Comp. B	mail@elitstroy.su
Density	approx. 1.75 g/cm ³ approx. 1.75 g/cm ³ approx. 1.75 g/cm ³	Comp. A Comp. B A+B mixed	
Mixing ratio. A:B	4 : 1 4 : 1	by weight by volume	
Glass transition temperature	> 56 °C		
Pot life	> 60 minutes at +20 °C		
Bending tensile strength	> 30 N/mm ²		
Compression strength	> 90 N/mm ²		
Adhesive strength	> 3 N/mm ² > 3 N/mm ² > 2 N/mm ²	on concrete; 3 days; 20°C on S&P laminates CFK on S&P Resin 230 levelling mortar	

Availability

5 kg and 15 kg (A+B) units

Application temperature and storage

May be used from +10° C to +35° C

Substrate temperature must be at least 3° C above dewpoint temperature.

Components A + B

May be stored for 1 year

Store between +5° C and +25° C

Homogenise before use; slowly warm up and homogenise frozen or supercooled material.

Bond behaviour

Bonding tests with S&P Resin 220 and S&P laminates CFK, surface-bonded onto concrete components:

TU Kassel Germany EIA Fribourg, Switzerland
 TU Braunschweig Germany CHUNGBUK National University Korea
 TU Lisbon Portugal and others

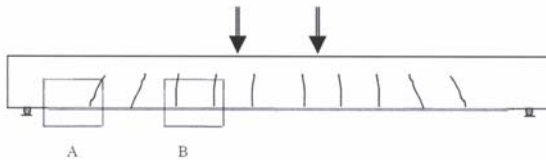


Fig. 1: Experimental investigation of bonded areas A (end of laminate) and B (between two cracks).

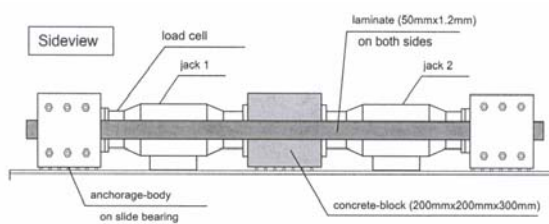


Fig. 2: Simulation of the different shear stresses on S&P Resin 220 adhesive.

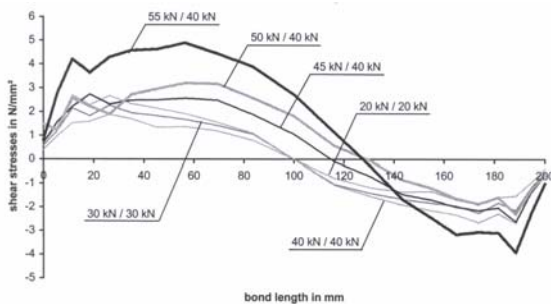


Fig. 3: Determination of the bond stresses for a 2-mm thick layer of adhesive.

The dimensioning models for the software FRP Lamella are based on bond tests using S&P Resin 220 adhesives and S&P laminates CFK. Detailed test reports can be obtained from the S&P Clever Reinforcement Company.

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