FIDSTRONG®

Luckfid Industry Co.,Ltd

Method Statement

FIDSTRONG Carbon Fiber Plate System

V20240801

Contents

1 Scope

This method statement serves as a guideline for the application of the FIDSTRONG carbon fiber plate system for structural strengthening. It should be used in conjunction with all relevant technical data sheets (TDS), material safety data sheets (MSDS), and specific project specifications.

Structural strengthening with this system must only be performed by trained and experienced professionals. For any further clarification or technical assistance, please feel free to contact FIDSTRONG's technical support team, who will be happy to assist.

2 System Description

The FIDSTRONG carbon fiber plate system is a high-performance structural strengthening solution that consists of carbon fiber plate and epoxy. The system typically includes FSL carbon fiber plates, levelling epoxy and a two-part epoxy-based carbon fiber plate epoxy FSE362.

2.1 System Composition

Carbon Fiber Plate:

The table below gives an overview of FIDSTRONG's common carbon fiber plate available.

Epoxy:

Specification	FSL12	FSL14
Color	Black	
Fiber Orientation	0° Unidirectional	
Density	1.6 g/cm³	
Fiber Content	Min 65%	
Width	5/8/10 cm or customized width	
Packaging	100m/Roll/Box	
Nominal Thickness	1.2mm	1.4mm

The table below gives an overview of the different epoxy used in the system.

Epoxy	Description	Consumption(kg/m^2)
Levelling Epoxy FSE502	Used to repair concrete surfaces to make them smooth.	Based on actual conditions
Carbon Fiber Plate Epoxy FSE362	Used to bond the carbon fiber plate to the concrete surface.	5~8

2.2 Limitations

The products must be used strictly according to their intended applications. System configurations, as outlined in the product data sheets, must be fully adhered to and cannot be altered.

The FIDSTRONG carbon fiber plate system may only be applied by trained and experienced professionals. All structural strengthening works must be supervised and directed by a qualified structural engineer.

For any specific construction or project details, always refer to the relevant engineer's specifications, detailed drawings, and risk assessments.

Local product variations may lead to differences in performance. Always use the most recent and applicable local product data sheets (PDS) and material safety data sheets (MSDS).

Ensure that batch numbers for FIDSTRONG plates and resins are recorded daily.

Large mixing quantities of the resin or high temperatures can shorten the pot life. To extend the pot life, reduce the mixing quantities and/or keep the materials cool by storing sealed units in a cool environment until just before mixing and application.

When working in extreme hot or cold conditions, pre-condition the resin materials in a temperature-controlled environment for at least 24 hours to ensure optimal mixing, application, and pot life on site.

Pay special attention to ambient environmental conditions. Ensure that the substrate, atmospheric, and material temperatures are within the prescribed limits, and avoid applying the system in dew point conditions (application temperature should be at least 3°C above the dew point).

The moisture content of the substrate must be less than 4%. All treated concrete surfaces must be dry, free of surface water, and ice-free.

This method statement is intended as a guideline and must be adapted to suit local products, standards, regulations, or any other specific requirements.

3 Equipment and Safety

3.1 Equipment

The equipment used in the FIDSTRONG carbon fiber plate system installation includes:

- Concrete grinder
- Vacuum cleaner
- Brush
- Application trowels
- Scraper
- Rubber roller

- Mixing Container
- Mixing Paddle

3.2 Protection

- Safety shoes, gloves, and appropriate skin protection must be worn at all times. It is strongly recommended to use disposable or clean protective clothing during material preparation and application.
- Always wear nitrile-based protective gloves when handling epoxy adhesives or impregnating resins, as direct contact may cause skin irritation. Apply barrier cream to hands and any unprotected skin areas before beginning work.
- Appropriate eye protection must be worn at all times while handling, mixing, and applying the products. It is recommended to carry an eye wash kit at all times.
- Wash hands with suitable soap and clean water after handling the products and before eating, smoking, using the restroom, or finishing work.
- Ensure that the work area is well-ventilated, and workers should take regular breaks in fresh air to avoid potential health risks.
- Silica dust produced during concrete grinding or blast cleaning can be hazardous. Use vacuum grinders or vacuum blast cleaning equipment with dust extraction and abrasive recycling systems. Always wear a dust mask or respirator when grinding concrete. Avoid inhaling concrete dust.

For more detailed health and safety information, refer to the relevant material safety data sheet (MSDS).

3.3 First Aid

If epoxy resin-based adhesive products contact with the eyes, immediately remove any glasses or contact lenses and rinse the affected area with clean warm water for 10 to 15 minutes. After rinsing, seek medical attention promptly.

Any chemical spillages on the skin must be cleaned immediately and thoroughly rinsed with clean warm water.

For more detailed health and safety information, always refer to the relevant material safety data sheet (MSDS).

4 System Application Procedure

4.1 Substrate Treatment

The substrate surface must be carefully treated. This includes but is not limited to removing the coating on the substrate surface, grinding the substrate surface with a grinder to expose

the solid base, and using high-pressure air to blow off the ground surface to ensure that the treated substrate surface is smooth, free of loose particles, and dust-free. If the substrate surface has large holes or defects (such as exposed rebar), the surface must be repaired with levelling epoxy FSE502 to make it smooth.

4.2 Plate Cutting

The FIDSTRONG carbon fiber plates can be ordered pre-cut to length or as a continuous roll, with the required lengths cut on site. When unpacking rolled products on site, they must be handled with care to ensure controlled uncoiling. Special attention should be given to avoid splintering at the plate ends. Loose carbon fibers may be present, so it is recommended to wear gloves, masks, and goggles while handling and working with the plates.

For on-site cutting, tape the area to be cut to minimize dust generation, and use a rotary disc cutter. Alternatively, a standard hacksaw can be used. Always support the FIDSTRONG plate on both sides during cutting to avoid splintering the ends, and ensure the cut is made perpendicular to the fibers. Note that carbon fibers are electrically conductive, so protect electrical equipment and electronics from the dust produced during cutting.

After cutting, clean the surface of the plates with a clean white cloth and FIDSTRONG-approved cleaner (such as an isopropanol-based cleaner) to remove any dust or grease. Ensure that the solvent has fully evaporated and the surface is completely dry before applying adhesive.

4.3 Epoxy Mixing

Weigh the A and B components of the resin according to the specified ratio, then mix them at low speed using a mixer (with a speed below 500 RPM) for at least 3 minutes, until the resin is fully blended with a uniform color and free of air bubbles.
Control the amount of resin mixed as needed to ensure it is used up within its working time.
The consumption of epoxy refers to section 2.1.

4.4 Apply Epoxy

Apply the FSE362 epoxy onto the carbon fiber plates surface, ensuring it is approximately 1 mm thick on the sides and 2 mm thick in the center of the plate. Carefully scrape a very thin layer of the thoroughly mixed FSE362 epoxy onto the prepared, dust-free substrate using a spatula.

4.5 Plates Placing

Place the coated FIDSTRONG carbon fiber plate onto the prepared concrete surface. Using a hard rubber roller, press the plate firmly onto the substrate until the adhesive is forced out from both sides of the plate.

Afterward, remove and properly dispose of the excess adhesive to ensure a clean and uniform finish.

Anchor the ends of the carbon fiber plates according to the design requirements.

4.6 Coating

Once installed, FIDSTRONG carbon fiber plates must be protected from the following conditions to preserve their mechanical properties:

- Permanent exposure to direct sunlight, which can lead to UV degradation of the epoxy matrix
- Continuous immersion in water
- Mechanical abrasion or impact damage

Proper protection measures should be implemented to ensure the long-term durability and performance of the system.

Once the resin has cured, apply the coating according to the design requirements.

5 Inspection

After the installation of FIDSTRONG carbon fiber plates, the pull-out tests should be conducted in accordance with EN 1542 or ACI 440.3 L.1 standards. Since pull-out testing is semi-destructive, it is recommended to apply an additional or leftover piece of FIDSTRONG carbon fiber plate to an adjacent area of the substrate that does not require strengthening but has comparable concrete quality and strength. This additional plate must be applied using the same method and timing as the other plates.

To check the installed FIDSTRONG carbon fiber plates for air pockets or voids within the adhesive layer or at the bond interfaces, tap the plates with a metal bar. Fully bonded areas will produce a distinctly different sound compared to areas with air pockets or voids. For a more precise assessment, ultrasonic testing methods can be used.

If a significant number of air pockets or voids are detected, the load transfer may be insufficient, and the FIDSTRONG carbon fiber plate will need to be replaced.

6 Legal Notes

The Information and recommendations relating to the application and end-use of FIDSTRONG products, are given in good faith based on our current knowledge and

experience of the products when properly stored, handled and applied under normal conditions. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: www.FIDSTRONG.com.