Method Statement

Nitoplate CP

Section A : General Comments

High temperature working

It is suggested that, for temperatures above 35°C, the following guidelines are adopted as good working practice:

(i) Store unmixed materials in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.

(ii) Keep equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment, which will come into direct contact with the material itself.

(iii) Try to avoid application during the hottest times of the day, arrange temporary shading as necessary.

(iv) Make sufficient material, plant and labor available to ensure that application is a continuous process.

(v) Where mixing water is required in the application of a product, it is advised to maintain such water at a maximum of 20^0C

Equipment

It is suggested that the following list of equipment is adopted as a minimum requirement

Protective clothing	:	Protective overalls
	:	Good quality gloves, goggles and face mask
Preparation equipment	:	Wire brush
	:	Proprietary blasting equipment
	:	Proprietary Degrease
	:	Grinding Machine
Mixing equipment	:	1 KW slow speed drill, 400 or 500 rpm + Fosroc MR4 mixing paddle + suitably sized mixing vessel
Application equipment	:	Rubber Roller, Serrated Trowel, Spatula

Application - points of note

FOSROC operates a policy to encourage the use, where possible, of registered applicators, since the long-term performance of the materials is dependent upon proper application.

Section B : Application Method

1.0 Surface preparation

Surface Preparation can be accomplished using abrasive or water-blasting techniques. All laitance, dust, dirt, oil, curing compound, existing coatings, and any other matter that could interfere with the bond of the FRP system to the concrete should be removed. Bug holes and other small surface voids should be completely exposed during surface profiling.

The concrete surface should be prepared to a minimum concrete surface profile (CSP) 3 as defined by the ICRI surface profile chips.

Preferred method is abrasive/grit blasting

- Removes surface laitance
- Opens pores allowing proper penetration of epoxy
- Provides good surface profile
- Exposes aggregates

- Grinding - Tends to ‘polish’ surface leads to poor adhesion.
- Scabbling/needle gunning -Profiles a good surface profile but can be too aggressive and damage concrete, loose aggregate.
- Acid etching is risky because the remaining cement may be weakened.

Application of Laminates :

1. Laminate Preparation :

- After surface preparation, check Surface smoothness with a straight-edge and level up the undulations using proper epoxy putties. Undulating surfaces may mean that plates in particular are unable to gain full adhesion.
- Follow the plans laid out by the engineer to ensure areas to be strengthened are clearly measured and marked straight.
- Apply masking tape on either side or marked edges to ensure clean edges are achieved.
- Cut the laminates using a sharp disc cutter. Beware of carbon splinters and make precaution against inhaling carbon dust
- Observe Gloss side and Matt side – Adhesion should be made to matt side. Put tape markers on Gloss side to ensure that downwards facing side is clear.
- Clean adhering side of the plate using appropriate thinners. Only very lightly dampened and ensure that the solvent dissipates prior to commencing further operations
- Once plate is cleaned, plate should only be handled using clean disposable latex gloves to ensure no contamination of bonded surface.

2. Mixing of adhesives:

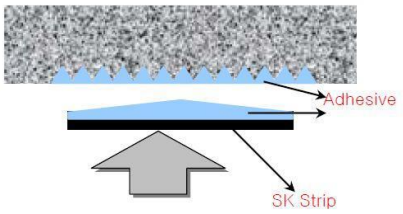
Mixing of adhesive should ideally be done in full units with no part mixing. Ensure that material is well mixed to time specified on technical data sheet.

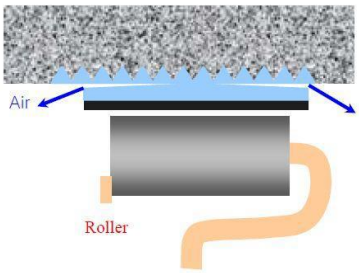
3. Application of adhesives:

- Using a trap mechanism use a domed feeder cut to apply a correct amount of resin adhesive to the plate.
- Feed the plate through ensuring that a consistent amount of resin is applied all the way along the length of the plate.
- A 2-3mm dome is generally sufficient but will depend upon the plate width for exact dimensions.
- Tapering the dome down to a feather edge ensures that air is extruded when the plate is pushed into position.

4. Application of Laminate

- Lift the plate into position and apply gently working wet adhesive onto wet adhesive all the way along the plate.
- After initial hand placement use a wooden or rubber roller to push the plate firmly into position.
- Ensure that resin extrudes all from the edges all the way along either side of the plate.
- After application of laminates, remove the masking tapes to get neat finish





Cross lamination detailing

When cross-applying carbon fibre strips, ensure that overlaying strip has a chamfer of epoxy to create smooth gradient over underlying piece.

- Ensures full bond
- Ensures no peel effect

After first plate has set in position create a long gradient up to the level of the surface of the carbon fibre plate. Allow this to harden.
Then apply adhesive and cross directional plate as normal.

5. Finishing

- Allow resin to set before beginning any adjacent processes.
- Some protection from UV and weathering may be advisable in external situations.
- A cementitious coating may be required.
- If a cementitious coating is to be applied. Apply a coat of epoxy resin adhesive to the cured finish and broadcast the wet surface with dry sand to provide mechanical key to cementitious coating.

Attention to full and proper preparation of the substrate is essential for complete repair adhesion.

1.1 Clean the surface and remove all traces of dust, oil, paint, curing compounds, grease, corrosion deposits, algae, grout holes, protrusions or any unsound material.

1.2 The surface should be preferably prepared by using high pressure water jetting or light abrasive blasting, followed by thorough washing to remove dust and remaining particles. Corrosion induced damages shall be repaired with Renderoc range of mortars, Nitozinc primer & Galvashield XP shall be installed wherever necessary. Substrate must have an open textured surface.

1.3 Oil and grease deposits are best removed by steam cleaning, detergent scrubbing or the use of a proprietary degreaser. The effectiveness of decontamination should then be assessed by a pull-off test.

2.0 Mixing

2.1 The hardener and the base shall be emptied in to a suitable container and the materials are thoroughly mixed for at least 3 minutes.

2.2 Mechanical mixing using a heavy-duty slow speed (300-500rpm) flameproof drill, fitted with a mixing paddle is recommended.

2.3 Mixed materials must be used within the pot life of the material. (Refer to technical Data Sheet)

3.0 Application

- Any damages to the concrete shall reinstated by using epoxy mortar Nitomortar S.
- Treatment to blowholes and imperfections: The blowholes and imperfections shall be sealed with epoxy putty, Nitocote VF /Nitomortar FC**.**
- The edges of the marked areas most be covered with masking tape on either sides of the marked surface.
- Nitoplate CP Carbon strips shall be cut to the recommended sizes before hand due to the impossibility of joint by lapping.
- Mixed adhesive is applied using a rubber spatula / serrated trowel on to the roughened surface of Nitoplate CP carbon strip such that the thickness of the epoxy adhesive is 2mm.
- The adhesive applied on Nitoplate CP carbon strip is now adhered to the prepared substrate and pressed using a roller such that excess mixed adhesive squeezes out from both the sides of the plate. The overflown excess material shall be removed using rubber spatula or by suitable means.
- UV Protective Coat: In case the substrate is in the exterior and exposed to UV a protective coat of Nitowrap 512 may be provided.

4.0 Cleaning

4.1 Nitowrap 40 should be removed from tools with Nitoflor Sol, immediately after use.

5.0 Curing

5.1 The adhesive will become tack free in approx. 4-6 hours and fully cured in 7 days.

Section C : Approval and variations

This method statement is offered by FOSROC as a ‘standard proposal’ for the application of Nitoplate CP. It remains the responsibility of the Customer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to FOSROC for comment, in writing, prior to the commencement of any work.