



Method Statement

Ref. #: DCP00/04-0004-A-2021



Cempatch FL

(Shrinkage compensated free flowing micro concrete)



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Section A : General Comments

General Notes:

The information below is a detailed overview for the application of DCP's **Cempatch FL** repair system and should be read in conjunction with the relevant technical data sheet prior to application. All DCP Products should be applied by experienced specialist contractors.

All the points below assume correct preparation of the relevant surface.

High Temperature Working:

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

- i. Unmixed materials and equipment should be stored in a cool shaded area and away from direct sunlight.
- ii. Avoid application during peak temperature of the day.
- iii. Plan for enough materials, tools and labor to ensure continuous applicant process.
- iv. It is recommended to use cool chilled water for mixing, to keep the mix temperature below 35°C, add ice in drums of water if needed.
- v. Do not add ice directly to the grout mix, and do not use 'dry ice' as a cooling agent.
- vi. Cool the mixer by charging it with chilled water, this helps reducing the heating of the mix

Low temperature working:

Cold temperatures retard setting times and decrease the flow properties of **Cempatch FL**. It is suggested that, for temperatures below 10°C, the following guidelines are adopted as good working practice:

- i. Unmixed materials should be stored at 10°C minimum to ensure optimum flow properties.
- ii. Use warm mixing water to provide the desired temperature for the mix.
- iii. Cold temperatures retard early strength gain. Warm, moist curing can be used in order to accelerate early strength gain.

Tools and Equipment:

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



<i>Personal protection</i>	:	<i>Protective overalls</i>	
	:	<i>Goggles or a face mask</i>	
	:	<i>Good quality gloves</i>	
	:	<i>Safety shoes</i>	
	:	<i>Safety helmet</i>	
<i>Equipment</i>	:	<i>Slow speed heavy duty mixing drill and mixing paddle (Fig.1)</i>	
	:	<i>Soft brush (Fig.2)</i>	
	:	<i>Stiff wire brush (Fig.3)</i>	
	:	<i>Hammer (Fig.4)</i>	
	:	<i>Chisel (Fig.5)</i>	
	:	<i>Mixer (Fig.6)</i>	
	:	<i>Pump (if required) (Fig.7)</i>	



Fig.1: Mixing drill & paddle



Fig.2: Soft brush



Fig.3: Stiff wire brush



Fig.4: Hammer



Fig.5: Chisel



Fig.6: Mixer (multi bag mixing)



Fig.7: Pump

Section B : Application

1.0 Substrate Preparation

1.1 Break Out

- 1.1.1 The area to be repaired should be marked on the structure using a spray paint, mark a line around the perimeter of the defective area.
- 1.1.2 Break out the marked area to remove all segregated concrete. Continue breaking out until a sound homogeneous substrate has been reached.
- 1.1.3 Saw cut around the perimeter of the repair to a minimum depth of 10 mm to avoid feather edges.



1.2 Steel Preparation:

- 1.2.1 Break along corroded steel bars until bright steel is observed.
- 1.2.2 Inspect steel reinforcement and replace if section loss is greater than 25%.
- 1.2.3 Clean all bars to bright steel, preferably by grit blasting ensure back side of bars are cleaned.
- 1.2.4 All grit blasted steel reinforcements should be primed within 2 - 4 hours with one or two coats of zinc rich epoxy coating **Repcoat ZR**.



1.3 Concrete Preparation:

- 1.3.1 Remove all dust, oil, grease, paint, and any other contaminants that could impair adhesion from the concrete surface.
- 1.3.2 Wash the substrate with clean water to remove all dust deposits.

2.0 Priming

- 2.1 Areas to be repaired with **Cempatch FL** should be soaked with clean water for before applying the repair mortar; all excess water should be removed.
- 2.2 Provided that the substrate has been thoroughly soaked with clean water, and is damp on application of product a primer is not normally required.
- 2.3 For concrete highly contaminated with soluble salts, it's recommended to use **Quickmast 108** (epoxy bonding agent), to prevent migration of salts, as well as providing bond for **Cempatch FL** to host concrete.

3.0 Shutter

- 3.1 Erect a grout-tight shutter. Care should be taken when designing the shutter to allow for the air to escape during application of the repair concrete. Provision shall be made for suitable access points to receive the repair concrete.
- 3.2 The internal faces of the shutter shall be treated with mold release agent, to ensure that water is not absorbed from the repair material by the shutter.



4.0 Mixing

- 4.1 Measure out 3.35 litre of clean, cool water into a suitably sized mixing vessel that has been pre-dampened. Ensure any excess water is removed.

*Note: when using an enhanced version of **Cempatch FL** the following mixing ratio should be followed:*

Product	Water	Product size
Cempatch FL 90	3.00 litre	25 kg bag
Cempatch FL 100	2.30 litre	25 kg bag



- 4.2 Slowly add one full 25 kg bag of **Cempatch FL** to the water and mix using a slow speed (400 –600 rpm) drill fitted with a mixing paddle, or a forced-action mixer.

Notes:

- *Continue mixing for a minimum period of 3 - 5 minutes until a smooth, even consistency is obtained.*
- *Dampen all surfaces of mixing equipment, removing any excess water.*

Multi Bag Mixing:

- For larger volumes, Pan Mixers or ribbon paddle-type mixers are most often used for mixing.
- Add 70 - 80% of the required mixing water, then add the bags slowly into the mix with the mixer running.
- Do not dump the entire bag contents at once.
- Mix for 3 minutes then slowly add the remaining water.
- Keep mixing until a uniform consistency is obtained, (1 - 2 minutes).

Notes:

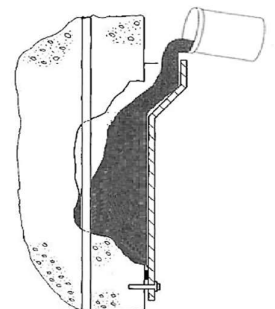
- *Slow speed mixer should be only used. Do not mix by hand*
- *The mixed material should be quickly transported to the shutter and placed.*
- *While mixing, ensure that the mixing blade is kept below the surface of the grout to prevent air entrapment.*

5.0 Placing

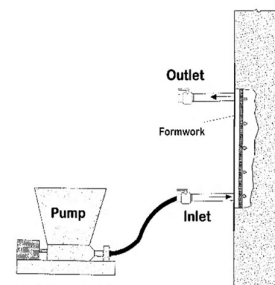
- 5.1 To gain full benefit of fluidity of the material, it should be placed slowly to prevent air entrapment within 25 minutes of mixing.

- 5.2 Placement should be a continuous process, to avoid formation of a 'cold joint'.

- 5.3 Pour **Cempatch FL** into the shutter until it is completely filled. Or alternatively, the mixed **Cempatch FL** can be poured using a funnel attached to a flexible pipe with a minimum diameter of 50 mm, the pipe is initially placed near the bottom of the formwork and starts raising as the pouring continues.



- 5.4 For pumping application, an inlet should be placed at the bottom of formwork in addition to an outlet at the top, the repair material should be pumped through the inlet into the formwork until all voids are filled and the material starts discharging from the outlet, plug both the inlet and outlet. And keep plugged for typically 9 – 10 hours at 25°C.



- 5.5 **Cempatch FL** does not require external vibration since it is self-compacting. However, tapping the formwork lightly with a hammer during placement will contribute towards effective consolidation of the material.

Notes:

- **Cempatch FL** should not be used when the ambient temperature is below 5°C and falling.
- **Cempatch FL** should not be exposed to running water either during application or prior to final set.
- Water ponding is not recommended for curing.

6.0 Curing

- 6.1 Keep the shutter in place for a minimum period of 24 hours. Where the repair is overhead, the shutter should remain in place for a minimum of 48 hours.

- 6.2 **Immediately** after the shutter has been removed, all exposed faces of the repair should be thoroughly soaked with clean water to remove residual traces of the shutter release agent.



- 6.3 Repaired surface should be cured in a similar method to concrete, curing can also be conducted using a curing compound which complies with ASTM C309, from **DCP's Setseal Range**

- 6.4 If curing to be conducted using curing compound:

- 6.4.1 Ensure the repaired surface is dampened with clean water prior the application of the curing compound.
- 6.4.2 Stir the curing compound well before use to ensure even pigment dispersion.
- 6.4.3 Hold the spray nozzle 450 mm from the concrete surface and spray apply the curing compound, pass back and forth to ensure complete coverage.
- 6.4.4 Pump pressure should be maintained to give an even, fine spray.
- 6.4.5 Protect the applied film from rain or any running water for at least 3 hours.
- 6.4.6 Care should be taken to ensure that the applied film is not broken.





Section C : Cautions

Health and safety

Cempatch FL may cause irritation to skin or eyes. Avoid contact with skin or eyes. In case of accidental contact with eyes, immediately flush with plenty of water for at least 10 minutes and seek medical advice if necessary.

Fire:

Cempatch FL is nonflammable.

For further information on refer to the Material Safety Data Sheet.

Section D : Approval and Variations

This method statement is offered by DCP as a 'standard proposal' for the application of **Cempatch FL**. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to DCP for approval, in writing, prior to commencement of any work. DCP will not accept responsibility or liability for variations to the above method statement under any other condition.