

Material & Workmanship Manual
for
fischer Injection Mortars FIS EM
+
Rebar



Material and Workmanship Specification

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Appendix 1 – FIS EM + Rebar loading table from fischer technical handbook (3rd Edition)

1.0 Scope and Purpose

This manual serves as a quality audit plan for fischer Injection mortar FIS EM. It also highlights the acceptance criteria for the installed FIS EM

The manual states the installation and inspection procedures for FIS EM.

2.0 fischer FIS EM Information

2.1 Description

The fischer Injection mortar FIS EM¹ is an Epoxy mortar. Each cartridge contains 2 components – Epoxy resin, cement and hardener.

2.2 Types

FIS EM 390 S



2.3 Identification Mark

The following identification mark could be found on the cartridge.

- a) fischer logo
- b) The cartridge capacity

¹ All types of fischer Injection mortar FIS EM in this document will be known as “FIS EM” unless otherwise stated.

2.4 Advantages

- a) Use with reinforcement bar or threaded rod.
- b) Expansion free fixing.
- c) Small axial spacings and edge distances
- d) Suitable for underwater installations (With reduced loading capacity)
- e) Suitable for diamond drilled holes.
- f) Very good bonding of the mortar ensures highest loads in concrete
- g) Performance just like cast in-situ reinforcement bars when design in accordance to Concrete Design Code such as BS 8110.
- h) Hard plastic cartridge for maximum handling safety.
- i) Partially used cartridges can easily be reused by changing the static mixer.

2.5 Materials

- a) Epoxy resin, cement, colour and hardener.

2.6 Suitable for

- a) Non-cracked concrete of strength classes more than C12/15².

3.0 Manufacturer's details

3.1 Company

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² 12N/mm² is based on cylinder compression strength and 15N/mm² is based on 150mm cube compressive strength.

4.0 Site Storage

fischer FIS EM shall be stored in a sheltered, well-ventilated space that is free from chemical, water, oil and pollutant. Storage temperature to be +/- 25 degree Celsius.

5.0 Installation

5.1 Tools and Accessories

- a) Electric hammer drill
- b) fischer dust blower (ABG)
- c) fischer cleaning brush
- d) Application gun

Application Guns

Type	Suitable for
Press gun FIS AK	FIS EM 390 S
Press gun FIS AM	FIS EM 390 S
Pneumatic gun FIS AP	FIS EM 390 S

5.2 Installation Parameters

Table 1 provides the installation parameters for each size of FIS EM with rebar. For more details, please refer to fischer technical handbook (3rd edition).

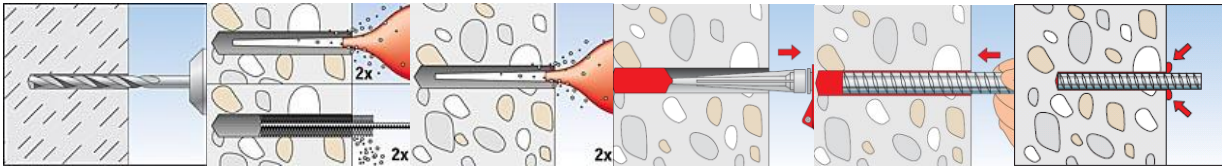
Table 1

Rebar Ø	Type	d _o (mm)
6	FIS EM + Dia 8 rebar	12
8	FIS EM + Dia 10 rebar	14
10	FIS EM + Dia 12 rebar	16
12	FIS EM + Dia 14 rebar	18
16	FIS EM + Dia 16 rebar	20
20	FIS EM + Dia 20 rebar	25
25	FIS EM + Dia 25 rebar	30
28	FIS EM + Dia 28 rebar	35

Legends:

d_o – drill hole diameter

5.3 Installation procedure



- Select the appropriate drill bit for d_o (refer to Table 1).
- Drill a hole till the minimum depth required.
- Blow out the drill dust from the drill-hole with ABG or compressed air unit twice.
- Brush with fischer cleaning brush.
- Blow out the drill dust from the drill-hole with ABG or compressed air unit twice.
- Fill the clean drill-hole with FIS EM by using the application gun.
- Insert rebar by turning it into the filled hole.
- Wait for chemical to cure as reference to table 2.
- Remove excess chemical.

Table 2. Gelling and curing time

Cartridge temperature (mortar)	Gelling temperature	Temperature at anchoring base	Curing time
- 5°C to + 5°C	4 hrs	- 5°C to + 5°C	80 hrs
+ 5°C to + 10°C	2 hrs	+ 5°C to + 10°C	40 hrs
+10°C to + 20°C	30 mins	+10°C to + 20°C	18 hrs
+20°C to + 30°C	14 mins	+20°C to + 30°C	10 hrs
+30°C to + 40°C	7 mins	+30°C to + 40°C	5 hrs

6.0 Recommended and Design Tensile Loads

Refer to Appendix 1

7.0 Acceptance Criteria

Any rebar fails to meet any of the acceptance criteria shall be rejected.

- a) FIS EM shall be installed in concrete with minimum strength class of C12/15.
- b) Drill bit diameter shall be equalled to d_0 given in Table 1.
- c) At least c_{min} and s_{min} given in fischer technical handbook(3rd edition) shall be provided without minus tolerances.
- d) No existing reinforcement/services in the base material shall be damaged during drilling.
- e) Drill-hole depth shall not be shallower than h_0 given in fischer technical handbook(3rd edition).
- f) Drill-holes shall be thoroughly cleaned before pumping in FIS EM.
- g) Installed threaded rod/rebar shall be $90^\circ \pm 5^\circ$ to the substrate surface.
- h) FIS EM shall be fully cured before loading.

8.0 Pullout Test (Optional)

Maximum Sample Size:

Randomly select and mark one (1) in every fifty (50) installed anchors of the similar type prior to any pullout testing.

Witnesses of Tests:

- a) Main contractor representative
- b) Approving person
- c) Applicator representative

Acceptance Criteria:

- a) No steel failure is observed before reaching the design load given in Appendix 1.
- b) No significant slippage of rebar is observed before reaching the required test load.
- c) Rebar holds at the required test load for 1 minute with no failure observed.

Method of Statement:

- a) Set pullout tester perpendicularly over installed anchor.
- b) Apply load gradually till recommended test load is obtained.
- c) Hold the maximum applied load for 1 minute.
- d) Read the applied load directly from the pressure gauge (in kN).
- e) Record the applied load and the mode of failure (if any).

10.0 Copyright of Manual

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