



Ferrocem 511HP

HIGH PERFORMANCE NON-SHRINK GROUT



Ferrocem 511 HP is a high performance non-shrink grout mortar specially designed to reach a high compressive strength values at 24 hours and is a type of liquid flow (Fluid consistency) suitable for pouring to fill gaps between of concrete floor and steel plates of concrete structures consists of a mixture of cement, mineral powders and special additives.

Advantages

- Excellent in flowability for filling gap.
- Non-Bleeding and non-silt.
- Non-Chloride in our formulation will not effect to corrosion in concrete structures.

Standards and compliances

Ferrocem 511 HP is manufactured under standard meets to ASTM C 109/C 109C, ASTM C 232, ASTM C 191, ASTM C 1090, ASTM C 882, ASTM C 1107

Area of use

- Pour concrete hollow structure repair, pole, beam.
- Pour bridge gaps and precast concrete wall gaps.
- Pour fill the gap between machinery base.
- Pour the gap between steel roof truss plate and concrete column head.
- Pour fill crane rails gaps.
- Pour the steel fixings to concrete.

Physical properties

| Properties | Value |
|---|----------------------|
| Colour | Gray powder |
| Dry density, kg./litre (Approx.) | 1.40 kg./litres + 2% |
| Wet density (Mixing water 15%), kg./litre (Approx.) | 2.2 kg./litres |

Technical properties

| Properties | Values | Standards |
|---|--|-------------------|
| Compressive strength of hydraulic cement mortar, ksc. (Approx.) - At 1 day - At 3 days - At 7 days - At 28 days | >400 ksc. >500 ksc. >550 ksc. >750 ksc. | ASTM C 109/C 109C |
| Bleeding of concrete, % (Approx.) | 0% | ASTM C 232 |
| Time of setting of hydraulic cement by vicat needle, Minute (Approx.) - Start - Finished | 297 minutes 375 minutes | ASTM C 191 |
| Change in height at early ages of cylindrical specimens of cementitious mixtures, % (Approx.) - Shrinkage value at 28 days | 0.06% | ASTM C 1090 |
| Bond strength of epoxy-resin systems used with concrete by slant shear, ksc. (Approx.) - At 7 days | >111.2 ksc. | ASTM C 882 |
| Flow of hydraulic cement mortar, % (Approx.) | 145% | ASTM C 1107 |

Method statement

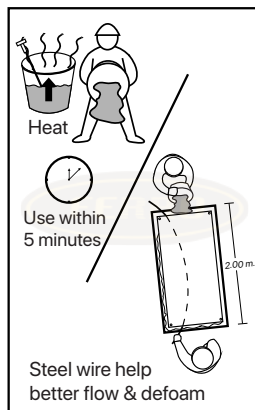
Ferrocem 511HP

Surface Preparation

- Concrete substrates must be sound, and clean without laitance. Oil, grease, curing compounds, or other contaminants that May obstruct bonding properties of grout mortar.
- Steel plate surfaces should also be soaked with water in order to reduce expansion from sunlight heat and should be cleaned without rust or oil contaminants.
- It is recommended to spray a small amount of clean water upon concrete floors under steel plate to reduce water absorption and support a better flow of non-shrink grout mortar but avoid making a water ponding on concrete surface.



Mixing Guide Line

- 1) Mixing and blending period was only preliminary recommendations, primarily to reduce water of Ferrocem 511 HP. However the required skills and methods empirically calcareous Ferrocem 511 HP prevent water stains. By relying on the expertise of the people as the core and the mixing should be stopped periodically. To observe the surface and to see that with Ferrocem 511 HP ready to pour or no is still smooth, not grainy no water stains, liquid fit. To no need to blender a mixing of full time, according to the recommendations. If you see that they are well Ferrocem 511 HP homogeneous.
- 2.) If the mixture stopped (Bleeding) should leave the 1-2 minutes to cure the chemical to absorb water stains then stirring gently with a wooden stirring if the surface has less water organic stains it can lead pour.
- 3) If then incubated still a lot of water. Should leave Should be discarded and not use.
- 4) Mixing guide line (Not mandatory) should be mixing with the low hand drill (Hand mixer) suitable for pour under small plate length not exceeding 2 m. pour Ferrocem 511 HP into clean container for mixing. The water by 1 bag 25 kg. dosage of 3.75 l. (15% by weight, use gallon measured water Ferro) to make the mixture is homogeneous. Stir with low speed mixing machine (No more than 300 rpm. gear 1 speed 5) by weighing and pour clean water down to at the bottom of the mixing tank blender before the start of the drill on the water and then pour Ferrocem 511 HP provides all the bag within approx. 30 seconds of continuous blender another 30 seconds. until Ferrocem 511 HP of the same colour uniform with a little water stains lap test in calcareous Ferrocem 511HP not tablets (Lump) and there are bubbles on the surface less (Low air bubbles) show that Ferrocem 511 HP is mixing homogeneous should be use proper timing. Introduced into the area, prepared and use it within 5 minutes if necessary can stimulate spin 1 minute again after then set aside 5 minutes



Tool

Mixing type hand drill around low.

| Drill data & Drill bit data | | Mixing stage |
|---|---|---|
|  <p>Ferrocem 500/511/ Mixer</p> | Drill data Electric power 1600W Gear 1 speed 5 150-300 rpm Electric current 220 V | - Mixing temperature 25 oC-35 oC. - Total mixing time 1 minute as follows. 1) Pour the water into the bottom of the tank clean 3.75 litres (15%) blender with low speed drill gear 1 speed 5. 2) Pour Ferrocem 511 HP into the water within 30 seconds continuous blender while pour Ferrocem 511 HP. 3) Blender continue for another 30 seconds observe Ferrocem 511 HP homogeneous without lumps or granules. Curing break air bubbles in the tank for 1-2 minutes. 4) Use the Ferrocem 511 HP within 5 minutes, urge with drill mixer again for 1 more minute if pour time is later than 5 minutes. Do not add more water. |
| | Drill bit data Drill bit size spiral M 14 x 2 Drill bit core size 16 mm. Drill bit diameter 166 mm. | |
|  <p>Ferrocem 500/511/ 3.75 L. (Gallon)</p> | | |

How to use

After mixing Ferrocem 511 HP, pour into the desired cavity use and Caution not to create air bubbles in the Ferrocem 511 HP by controlling the pour pressure to be consistent all the time. The form prepare for pour must be dense and not leaking.

Selection Table of non-shrink grout Mortar by GAP size

| Item | Gap size (mm.) | Product Name | Type |
|------|----------------|-------------------------|--------------------------------|
| 1 | 1-5 mm. | Ferrorez 717 | 2 components epoxy grout. |
| 2 | 5-10 mm. | Ferrorez 721 | 3 components epoxy grout. |
| 3 | 10-50 mm. | Ferrocem 500 GP, 511 HP | Coarse non-shrink grout mortar |
| 4 | 50-200 mm. | Ferrocem 515 | Gravel non-shrink grout mortar |

Selection Table of Non-Shrink Grout Mortar by Application

| NON-SHRINK GROUT Selection | Ferrocem 500 GP | Ferrocem 511 HP | Ferrocem 515 | Ferrorez 717 | Ferrorez 721 | Remove |
|----------------------------|-----------------|-----------------|--------------|--------------|--------------|------------------------------------|
| ACID SPILLAGE | | | | ● | ● | |
| CRANE RAIL | | ● | | | ● | |
| ANCHORING | ● | ● | | | ● | |
| MACHINE BED | ● | ● | ● | ● | | See gap table |
| CONCRETE REPAIR | ● | ● | ● | | | |
| WIND TURBINE BASE | | ● | | | | |
| LARGE VOLUME | | ● | | | | Extend flowable time to 45-60 min. |
| PRECAST PANEL JOINT | ● | | | | | Good flow at 10-15 min. |

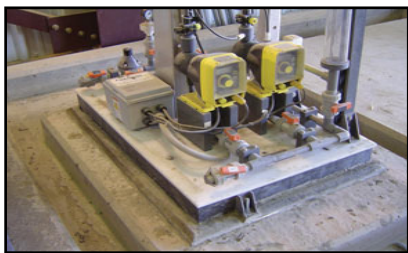
Grouting large cavities (5-10 cm.)

Add small rocks 4-8 mm. (3/8") (Prewet) by quantity 3-6 kg. % of Ferrocem 511 HP (25 kg.) mortar and clean water (15%) mixing until reach homogeneous. Add rocks may reduce a Ferrocem 511 HP flowability and help import crack resistance caused by heat from hydration reaction. Recommended to reinforce with a wire mesh steel if pour thickness is greater than 100 mm. or use a specific gravel grout such as Ferrocem 515.



Machinery Beds grouting

- Spray water to clean concrete floor. Do not water ponding into a screw hole. Should be pour Ferrocem 511 HP into a screw hole the imperative first step before pour under base plates.
- Gap between concrete floor to steel base plates should be 10-50 mm.



Base Plate Grouting

- Spray concrete substrate with clean water 2-3 hours. prior to grouting works, avoid water ponding left on surface.
- Cool down heat of base plate (From sunlight) by covering with moist blanket be for grouting works. Inspect leakage and stengthness of mould.
- In case of long plate move than 1 m., it is allowed to use \varnothing 2-4 mm. steel wire to urge a flowability of Ferrocem 511 HP.



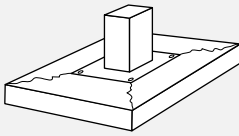
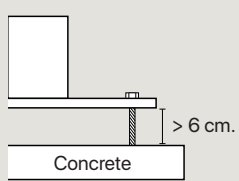
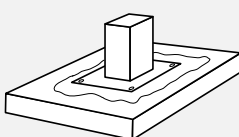
Limitations/Cautions

- Ferrocem 511 HP is designed for gap width from 10-50 mm. if apply in thickness more than 50 mm. it tend to be crack.
- Surface temperature should be 25-35 °C.
- Do not use Ferrocem 511 HP in cold storage works.
- Do not over excess water more than 15 % by weight of Ferrocem 511 HP. use only tap water.
- Do not use river or sea water.
- Avoid mixing and pour in the sun, strong wind.
- Do not use Ferrocem 511 HP as a floor topping.
- Pour Ferrocem 511 HP under base plate in hot windy condition may cause crack from stressness of steel plate corner expansion while Ferrocem 511 HP is still in compressive strength development stage so it is recommended to cool down base plate by covered with moist blanket prior to works.
- In case of long distance under plate, use more than 1 mixer or continuous mortar pump.
- Consult our technical department if use Ferrocem 511 HP in special objectives such as length, width & thickness, distance, vibration & chemical conditions etc.
- Mixing time and drill speed is only a guide line.
- Product data from bag is not considered an obligation or legal reference as it may not be the latest. Therefore, the purchaser must request data sheet with the latest update from the company before the actual use of the product every time.

Technical support

Customers can contact the sales department of the company at sale@ferroproduct.co.th to inquire about product usage methods. Furthermore they can also request information or organize the following activities :

1. Request for the latest updated data sheet.
2. Request for the sale conditions document and the product price list.
3. Schedule a technical staff visit to demonstrate the products at the customer's job site by filling out the "Demonstration request form" prior to the product purchase.
4. Schedule a technical staff visit to provide product usage training to the customer's workers at the job site by filling out the "Worker training request form".
5. Schedule training for the customer's foreman at the company's training center (Ferro training center) by filling out the (Foreman training request form).

| 1. Corner crack of steel plate | Cause | Problem shooting |
|---|--|--|
|  | 1.1 Too hot steel plate by strong sun cause stress and expansion of the plates corner. This stress will break Ferrocem 511 HP which is in setting stage. | 1.1 If the steel plate temperature is above 35 oC spray tap water or cover with soaked blanket during grouting works. 1.2 Add wet pea gravel 3/8" approx. 3-6 kg. per 25 kg. bag of Ferrocem 511 HP to help better compressive strength. |
| 2. Gap wider than 6-10 cm. may cause crack. | | |
|  | 2.1 Ferrocem 511 HP is designed for gap width from 10-50 mm. *See selection table of non-shrink grout mortar in datasheet. | 2.1 Selection a proper product to fit the blanks according to the datasheet. |
| 3. Bleeding | | |
|  | 3.1 Add too much water more than 15% by weight (3.75 litres/bag 25 kg.) will get the best quality both in terms of compressive strength and flow. 3.2 Not use drill and blender bits and gallon measured water Ferro. | 3.1 Prepare a proper weighing scale and water container before starting. 3.2 Use only a drill low speed mixer not above 150-300 rpm. and control a mixing time around 1 minutes per mixing 1 bag (25 kg.). |

Coverage

Ferrocem 511 HP mixing with 1 litre (15%) of water will use a dry Ferrocem 511 HP for approx. 2 kg. For 1 m³ use number 78 bags x 25 kg. and water 292.5 litre.

Package

25 kg./bag (80 bags/pallet).




Cleaning tools

Wash all tool with clean water before the Ferrocem 511 HP is dry.
In cases a dry Ferrocem 511 HP sticks tightly on a tools, use mechanical methods such as chiseling equipment.

Storage

- 6 months.
- Keep in dry shaded area, temperature 23 °C + 2%, Humidity 50 + 5%RH (Conform to ISO 554)

Health and safety instructions

- May cause health effect :
- Eye : May cause eye irritation.
- Skin : May cause skin irritation.
- Ingestion : May cause vomiting or nausea if swallowed.
- Inhalation : No serious effect.
-  • Inhalation : Move to fresh air, oxygen support if necessary. In case of breathing difficulty is occurred continuously, should taken care by medical treatment.
- Eye : Flush with clean water at least 15 minute. if irritation still exist, see medical attention.
- Skin : Clean the irritation area with mild soap and water, if burning is still exist, see physician immediately.
- Ingestion : Do not induce vomiting. call physician immediately.

Disposal

Ferrocem 511 HP is composed of cement disposal do not put waste into public drainage, It is recommended to leave the cement dry with sunlight.

Transportation and shipping data

| | | | |
|----------|------------------|------|------------------|
| THAI DOT | : Not regulated. | IMO | : Not regulated. |
| USA DOT | : Not regulated. | IATA | : Not regulated. |
| RID/ADR | : Not regulated. | | |



Size

25 kg./bag

80 bags/pallet

Code FG-5IC-8858915255013

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②



Equipment

- Drill and blender bits
Code FG-OE-0002
- Gallon measured water Ferrocem 500 GP /511 HP/3.75 l. (Gallon)
Code FG-SM-00077

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Product warranty: The company is pleased to replace any product that is clearly proven to be defective due to manufacturing processes with a new products of equal value to the portion that is defective. Refunds are not available. Customers must be notify us of replacement within 7 days from the order date. Additionally customers can't claim damages resulting from direct or indirect using of the materials, as well as delays in delivery by the company. Furthermore replacements can't be made for errors in using that arise from customers negligence without consulting the sales staff or technical documentation provided by the company. The company reserves the right to amend manufacturing formulas or new packaging designs without prior notice. Therefore customers must be request the data sheet and sale conditions from the company before actual using and before each purchase. By doing so the company assumes that customers have understood and agreed to the company's sale conditions before using. (Company products are only allowed for using by individuals who have completed training provided by the company). *For further data please refer to the sale conditions from the company's sale department at sale@ferroproduct.co.th.



ISO 9001 & ISO 14001



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