

KALMATRON® KF-Jet Cement

Application instruction for injections

The following instructions have been developed for application of KALMATRON® KF-Jet Cement for injections into soil and structures to provide compaction of crumbled areas while increasing the density, compressive strength, and impermeability. Due to the differences in the water acidity, alkalis content, temperatures and humidity of air on job sites, we have to recommend that technological adjustments are made by the supervision of an experienced foreman to avoid material loss and equipment damage.

■ PREPARATION OF MIX FOR INJECTIONS

1. Take a batch of KF-J cement that is enough to provide for a one-time injection, in accordance with the equipment's capacity. Turn on the mixer loaded with dry KF-J.
2. Prepare the correct amount of water to provide a water-to-cement ratio between 0,4 and 0,45.
3. Pour the entire amount of water into the rotating mixer to get cement slur.

■ ADJUSTMENT OF SETTING TIME

- 1 Mix cement slur for 1 minute.
- 2 Please, take 1-Liter volume jar and pick up slur from the center of mixer.
- 3 Do not stop mixer during the next procedure:**
 - 3.1 Pour the contents from the jar with cement slur on a glass or plastic plate 50 cm x 50 cm.
 - 3.2 Please check the setting time, based on the type of KF-J you are working with, either 3, 5 or 10 minutes.
 - 3.3 If setting time is shorter than required, please add 500 ml of water per 100 Kg to the cement slur.
 - 3.4 If setting time is longer than required, please start by adding 2 Kgs of KF-J per 100 Kg of cement slur.

■ INJECTION APPLICATION

1. Depending on the equipment and volume of application, please apply pumping pressure gradually from $\frac{1}{2}$ bar until the resistance to pumping pressure will be retarded.
2. Increase the pressure up to 2 times to get cement slur moving through the hose and needles.
3. Keep injection moving until an excessive cement slur will come up around the needles.
4. Turn off the pump and wait for an hour for stable results.
5. In the case that bubbles appear around the needles, please proceed pumping for stable result.

■ ATTENTION

For job sites with severe and pressured leaks it is necessary to inject KF-J in a dry form. Air pressure of the compressor transporting KF-J powder to the source of the leak should be equal to or higher than the original pressure of the leaking water (or any liquid).

■ QUALITY CONTROL

It is a necessity to provide quality control 24 hours after the application. The methods for quality control are varied and depend mostly on the particular situation. Observations of the stopped leaks and dried surface where the application was applied are the most important.

KALMATRON® KF-Jet Concrete

Application instruction for concrete repair

The following instructions are developed for the application of KALMATRON® KF-Jet Cement for repair of crumbled concrete and masonry structures to provide compaction of crumbled areas while increasing the density, compressive strength, and impermeability. Due to the differences in water acidity, alkalis content, temperatures and humidity of air on job sites, we have to recommend that technological adjustments are made by the supervision of an experienced foreman to avoid material loss and equipment damage.

■ SURFACE PREPARATION

Wash the surface of the contaminated concrete with water at a rate of 1 gal/ sq. yd. or (6 Liter/m²).

Remove spots of paint by scraping or sand blasting.

■ PREPARATION of KALMATRON® KF-Jet

1. Prepare the dry batch of KF-Jet Concrete in accordance with Table 1 (see Attachment 1).
2. Turn mixer on for 1 minute. Add water to get a water-to-cement ratio between 0.4 and 0.45.
3. In case the batch is still stiff, please add proportionally 250 grams of water per 1 cubic meter.
4. Continue mixing until application is completed.

■ APPLICATIONS

1. KF-Jet Concrete might be applied manually or by shotcrete technology.
2. Thickness of the application should be chosen in accordance with existing standards.
3. Take a batch of KF-Jet Concrete and verify setting time.
4. Provide curing of new concrete with spray of water on the surface every 8 - 12 hours after application during the first 48 hours, or strew 30 mm of wet-to-soaked sand until natural drying occurs.
5. For the best result, use KF-Jet Concrete at a minimum temperature on the surface of 17°C.

■ SAFETY

Operation with KF-Jet Concrete is similar to finishing jobs. Always use an approved respirator and rubber gloves. In case KF-Jet Concrete is inhaled or gets in contact with the eyes, rinse and wash abundantly with water. KF-Jet Concrete is non-toxic and non-explosive.

■ WARRANTY

The following warranty is made in lieu of all other warranties, either expressed or implied. This product is manufactured of selected raw materials by skilled technicians. Neither seller nor manufacturer has any knowledge or control concerning the purchaser's use. The only obligation of either seller or manufacturer shall be to replace any quantity of this product, which is proved to be defective. Any claim of defective product must be received in writing within six months from date of shipment. Neither seller nor manufacturer assumes any liability for injury, loss, or damage resulting from use of this product.

MIX DESIGNS WITH KALMATRON® JET CEMENT**KF-JET- CONCRETE MIX DESIGN**

Designed for building and quick repair of concrete and masonry structures by pouring and shotcrete technology. Set time and 1 hour compressive strength data may vary for temperatures lower/higher than 18 °C and humidity above/lower than 75%.

Table 1

Mix design	KF-J3 Set time is 3 minutes; Strength in 1 hour: 20 MPa; - in 28 days: up to 70 MPa;	KF-J5 Set time is 5 minutes; Strength in 1 hour: 14 MPa; - in 28 days: up to 64 MPa;	KF-J10 Set time is 10 minutes; Strength in 1 hour: 6 MPa; - in 28 days: up to 58 MPa;
Ingredients	Kg/m³	Kg/m³	Kg/m³
KF-J Cement	300	330	350
¾" Aggregate	720	740	760
½" Aggregate	460	470	480
Coarse sand	515	520	521
Fine sand	222	223	223
Water	127,5	148,5	159,25
Total:	2344,5	2431,5	2493,25
W/C	0.425	0.450	0.455

KF-JET- MORTAR MIX DESIGN

Designed for quick repair of concrete and masonry structures by shotcrete technology. Set time and 1 hour compressive strength data may vary for temperatures lower/higher than 18 °C and humidity above/lower than 75%.

Table 2

Mix design	KF-J3 Set time is 3 minutes; Strength in 1 hour: 18 MPa; - in 28 days: up to 30 MPa;	KF-J5 Set time is 5 minutes; Strength in 1 hour: 15 MPa; - in 28 days: up to 30 MPa;	KF-J10 Set time is 10 minutes; Strength in 1 hour: 13 MPa; - in 28 days: up to 30 MPa;
Ingredients	Kg/m³	Kg/m³	Kg/m³
KF-J Cement	300	330	350
Coarse sand	1050	1050	1050
Water	127,5	148,5	159,25
Total:	1477,5	1528,5	1559,25
W/C	0.425	0.450	0.455

KF-JET- SLURRY CEMENT MIX DESIGN

Designed for consolidation of soil, concrete, and masonry structures by injections and shotcrete technology. Set time and 1 hour compressive strength data may be varying for temperature lower/higher of 18 °C and humid above/lower 75%.

Table 3

Mix design	KF-J3 Set time is 3 minutes; Strength in 1 hour: 20 MPa; - in 28 days: up to 30 MPa;	KF-J5 Set time is 5 minutes; Strength in 1 hour: 18 MPa; - in 28 days: up to 30 MPa;	KF-J10 Set time is 10 minutes; Strength in 1 hour: 16 MPa; - in 28 days: up to 30 MPa;
Ingredients	Kg/m³	Kg/m³	Kg/m³
KF-J Cement	300	330	350
Water	127,5	148,5	159,25
Total:	1477,5	1528,5	1559,25
W/C	0.425	0.450	0.455

Note: Mixes shown above are stiff after the first water application. The amount of water should be adjusted at the job site in accordance with equipment needs. Water should be poured after preparation of dry mix. Please apply the water to get the W/C, shown above in tables 1,2,3, carefully by adding 200 grams at one time during the mixing. Do not stop the mixer for supplementary operations.