



سبراي كون تكنولوجي  
SPRAY CON TECHNOLOGY W.L.L

# METHOD OF STATEMENT

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## **METHOD STATEMENT**

### **1. Introduction**

1.1 Cementitious based coating for rotor stator machines are wet mix spray applied fire resistive materials used over structural steelwork. The product may also be used to upgrade the fire protection level of metal decks.

1.2 The following application methods should be followed to ensure that the sprayed Cementitious based coating provides the approximate density of 310kg/cum.

### **2. Material Storage**

2.1 MK-6s must be stored in a dry environment. It should be stored off the ground, under a weatherproof cover, and protected from damp surfaces or areas of high humidity. Storage temperatures are not critical as long as dried conditions are maintained.

2.2 MK-6s can be stored for up to 6 months from date of manufacture under dry conditions. It is recommended that materials from one shipment be completely installed before using material from a subsequent shipment. Material damaged by moisture should not be used.

### **3. Site Requirements**

3.1 Prior to commencement of work ensure that adequate service utilities are in place and work front releases are available for application to commence. These site requirements comprise some or all of the following; power, water, lighting, ventilation, scaffold, tarpaulins, waste disposal, compressed air source plus serviced spray machines with adequate spares.

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3.2 Application temperatures: when temperatures at the job site range from 20 to 45 degree centigrade to ensure a comfortable drying time.

#### 4. Health and safety precautions

4.1 Cementitious based coating contains no asbestos and causes no health hazard either before, during or after installation. During application, however, the following precautions must be taken:

4.1.1 Protect skin from irritation by wearing proper coverall and gloves; wash work clothing separately from other garments.

4.1.2 Protect eye and respiratory tract from airborne product by wearing dust guard and goggles, safety glasses or eye protector.

4.1.3 Eyes and skin areas that come in contact with Cementitious based coating should be rinsed with cold and clean water.

4.1.4 Cementitious based coating is slippery when mixed with water. Do not allow wet material to remain on scaffold, ladder rungs or floor. Walking on wet mix may result in slips or fall.

#### 5. Equipment

5.1 **Mixer:** a paddle or ribbon-type plaster mixer with a safety guard, rubber tipped blades and provision for quick dumping of mix directly into pump hopper is required. Mixer with a 155 liter [5 ½ cu. Ft] capacity or larger with minimum operating speed of 35 to 45 rpm are required.

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5.2 **Rotor/Stator Pumps:** these pumps are used for lower production rate jobs and on jobs where the equipment must be located on the floor to be sprayed. Only open throat, screw feed pumps with soft rubber stator are recommended.

5.3 **Air Compressor:** a compressor with a capacity of 200 to 500 liters/minute [10 – 20 cuft/min] of free air is recommended for smaller jobs.

5.4 **Air Hose:** air hose should have a minimum 10mm [3/8”] inside diameter.

5.5 **Material Hose:** the material hose used should be reinforced, smooth interior vulcanized rubber, as used in the plastering industry. This hose should be capable of handling high pressures consistent with the pump being used.

Flexible hose using 32 to 51mm [1 ¼” or 2”] id material hose, hose for use up to 30 mtrs.

5.6 **Hose Coupling:** screw on type quick connect/disconnect coupling that do not restrict material flow are recommended, a constant inside diameter must be maintained. A long taper reducer must be used when a reduction in hose diameter is necessary.

5.7 **Spray Nozzle Assembly:** the spray nozzle assembly should consist of a minimum 25mm [1”] id aluminum tube with a blow-off type nozzle cap, nozzle orifice, material and air control valve.

5.8 **Nozzle Orifice:** minimum 13 to 16mm diameter [½” – 5/8”] nozzle orifice

5.9 **Thickness Probe:** a calibrated thickness probe should be used for measuring thicknesses of sprayed material



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**5.10 Tools Box:** should be available at all sites. The crib should contain the following items:

Duct tape  
Screwdrivers  
Hose couplings, extra v belts  
Spare spray tips  
Spanner set  
Hammer  
Thickness probe  
Measuring scale  
Utility blades

**5.11 Scaffolding:** mobile scaffolding should be provided for applications that are not accessible from the floor. Scaffold should have locking wheels that roll easily and grated floors or perforated platforms to allow overspray's to pass through, scaffolding should be equipped with safety railings around its perimeter approximately waist-high that comply with safety requirements.

**5.12 Masking:** Cementitious based coating overspray would stain masonry surfaces or objects. and therefore fireproofing shall be carried out immediately after casting of concrete and before any other trade activity takes place. Necessary masking to other trade work be provided to protect from overspray.

## **6. Project Setup**

**Efficient project setup results in time savings – time saved is money earned.  
Check all site requirements have been met.**

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**6.1 Application Equipment:** select a ground level location that is protected from bad weather, good drainage, easily accessible to truckload deliveries, well ventilated especially while using liquid fuel power driven equipment or easily accessible to power point and continuous supply of potable water.

**6.2 Suitable Platform** for machine operator to conveniently feed Cementitious based coating into the mixer.

**6.3 MK-6s** should be stacked of the ground so that it is protected from damp floor and is easily accessible to he mixer operator.

## 7 Preparation of Base Surface

**7.1 Clean Substrate:** proper adhesion of Cementitious based coating is dependent upon clean substrate to be fireproofed. Ensure the following conditions do no exist whilst applying MK-6s

Residual roll oils

Loose mill scale, rust or dust

Loose concrete

No compatible Painted surfaces

Other foreign contaminants that may impair bonding to substrate.

**7.2 Flexible Substrate:** proper adhesion of Cementitious based coating depends upon rigid substrates and the absence of damaging forces such as impact or excessive deflection. Make certain that the following conditions do not exist before applying Cementitious based coating:

Roof traffic before the Cementitious based coating is set.

Excessive vibration

Deck spans greater than L/240 mid point deflection





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### **7.3 Typical Substrate – Recommendations**

7.3.1 Do not apply Cementitious based coating to structural steel prior to the completion of concrete work on the supported floor. Clips, anchor fasteners, hangers, supports, sleeves and other attachments to the substrate are to be placed by others prior to the application of Cementitious based coating.

7.3.2 Ducts, pipes, conduits or other suspended equipment to be installed after the application of Cementitious based coating

7.3.4 Bare structural members wire brushed freed from loose mill scale, oil, grease, foreign contaminants, rust or dust can receive direct application of Cementitious based coating.

**7.4 Primed/Painted Structural Steel: May adversely affect the bonding of Cementitious based coating mix thus jeopardizing the effectiveness of the coating.**

### **8. Adhesive Pre-Coat – Not Required for Bare Steel**

8.1 As you have a Gloss finish paint it would have to be removed by mechanically upbraiding it or applying a Paint remover.

### **9 Application Technique**

9.1 The application of MK-6s coating consists of mixing the premix with potable water in a paddle or ribbon type mixer. The mixed material is then transferred into the hopper of the pump where it is conveyed through the hose to a spray nozzle, where the slurry is broken up into a fan pattern by air and directed to the surface to be covered in an even, uninterrupted pattern.

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9.2 Water requirements: the integrity and pumping properties of Cementitious based coating are largely dependent upon maintaining the correct water amount when mixing. The required amount of water for mixing Cementitious based coating is between 34 – 38 liters per bag. Water should be potable and between 10 – 32 degree c. low water temperature may effect the mix time.

9.3 Mixing: MK-6s coating is delivered in 20 kg packing. It is mixed by first measuring the appropriate quantity of potable water into the mixer and adding Cementitious based coating into the mixer and mixing until the proper density is achieved.

9.4 Low water-to-product ratio results in a mix that is too thick and difficult to pump cavitations in the hopper usually occurs, which results in an inconsistent, pulsating spray pattern.

9.5 High water-to-product ratio results in a thin mix that pumps and sprays at a faster rate, but yields thinner coats of material and a rough surface texture. Low densities results in material sliding and delaminating are characteristic and cracking to the surface of materials.

9.6 Mix MK-6s until optimum mixer slurry density of 610 – 690 kg/cumtr. is achieved. This typically requires 3 minutes of mixing based on the mixer speed of 40 rpm.

9.7 After 3 minutes of mixing, fill a container of known volume, weigh and determine the density of the slurry

9.8 Mix time and/or increase the water content. If the slurry density is higher than 770 kg/cumtr increase the mix time and/or decrease the water content.

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## 10. Pumping and Spraying Technique.

10.1 Priming pump: it is essential that the pump and material hose be flushed with water before the start of operation for a trouble-free application. Cementitious based coating pumped through a dry hose will result in blockages in the hose and/or nozzle.

10.2 Pumping: Cementitious based coating is discharged from the mixer into the pump hopper through the fixed safety grid. When the mixed material has been poured into the hopper check that it has formed into homogenous slurry without cavitations prior to spraying the mix.

10.3 Nozzle orifice shall have an inside diameter of 13 – 16mm.

10.4 Spray technique: open the air valve, which is typically found, located on the spray gun. Turn on the remote switch of the pump, spray into a bucket until all the water from the hose exits and full pressure builds up. Set the air adjustment device to achieve an even fan pattern of cementitious based coating using the minimum quantity of air pressure possible. 10psi is recommended. When the system is correctly set it should give a dull buzzing sound. If the system is emitting a whistle the air pressure is too high. After the system has been purged it is probable that the first priming mix will be too sloppy. Make sure that there is no restriction of material flow. Hold the nozzle perpendicular to the substrate at a distance of 0.3 – 0.6 m. move the nozzle in a smooth left to right motion to achieve a full, even pattern. Always position the nozzle perpendicular to the substrate.

10.5 Application thickness: apply cementitious based coating to various pre determined coats. The thicknesses measured shall be recorded in the thickness chart for inspection.

10.6 Set: Cementitious based coating will obtain initial set in approximately within 3 – 6 hours depending on prevailing temperature and humidity.

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10.7 Finish: spray application of MK-6s coating results in a natural spray textured finish.

10.8 Application technique: regardless of the substrate being sprayed, it is radically important to maintain the required distance between the nozzle and the substrate surface. This distance will vary according to the type of equipment and nozzle used. Which would be between 0.3 – 0.6 m.

10.9 When spraying the soffit beams it is essential to spray the top side of the lower flange first. Thereafter the section can be sprayed in any order.

## 11. Thickness

11.1 Appropriate thicknesses rendered should be checked by using a calibrated propped and recorded whilst spraying.

11.2 Excessive thicknesses may result in deboning and/or prolong drying time and is the most common reason for reduced yield and shrinkages.

## 12. Density

12.1 Density must be in accordance with manufacturing standards.

12.2 Controlling density: the following parameters must be controlled to achieve correct densities

**A Distance of spray nozzle from substrate**

**B Water-to-product ratio**

**C Mix time**

**D Length of standup pipe and hose**

**E Amount of air flow at the nozzle**

**F Angle of nozzle to substrate**

**G Suitable orifice size**

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### 13. Project Shutdown

#### 13.1 Termination of spray application:

Switch off the remote of the pump

Shut the material valve

Shut the air valve. Leave the air valve one quarter open if material valve is close

The maximum time the nozzle could be shut is for 45 minutes, with the nozzle submerged in water to prevent blockage.

#### 13.2 Cleaning of Equipment

13.2.1 **Mixer:** after removing any Cementitious based coating material flush clean with water. Scrape hard buildup materials on blades and sides of the mixer.

13.2.2 **Pump:** allow sufficient quantity of water to be pumped through the hose and the nozzle from the pump to be flushed clean. Disconnect the hose at the pump exit and insert a small sponge into the hose. Detach the nozzle and the 25mm whip hose and commence pumping water through the hose. Always maintain low airflow, so that the air hose does not get blocked.

### 14. Job Precautions

14.1 Never allow the pump to run dry whilst operation

14.2 Keep hose lengths to a practical minimum

14.3 For electric motors, use a heavy-duty extension cords with lengths compatible with electrical requirements. Always ground the machine for safety: avoid circuits where other power machines are being used. observe all HSE safety requirements.

14.4 Do not operate petrol or diesel powered equipment in closed or poorly ventilated room. If an exhaust system is used make sure it works. Engine exhaust must be vented to the outside.

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14.5 Hose connections should not reduce the inside diameter of the hose.  
Improper connections can result in blockages.

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