



## **WORK GUIDELINE No. 8**

### **Concrete surface protection**

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## **1 Purpose and scope**

After completion of concrete damage repair, all visible concrete surfaces, both repaired and non-repaired, shall be protected by applying suitable coatings.

The purpose of protective coatings is to provide a barrier between the concrete surface and the atmosphere thus reducing direct adverse atmospheric actions on concrete. Impacts such as frost, wetting of concrete, contamination of concrete with chlorides, increase of CO<sub>2</sub> diffusion resistance, etc. are taken by the applied paint coats.

The present WG No. 8 defines surface preparation, temperature, and humidity conditions for paint application, types of concrete surface protection on individual structural members, as well as methods of surface protection execution on bridge structural members.

In view of the exposure conditions of individual structural members to atmospheric actions two different surface protection systems based on different protective coatings are considered.

## **2 Reference documents**

For epoxy and acrylic-polyurethane coating refer to SINIT Technical Data Sheets: Coat/2 for #777 PRIMER, Coat/3 for #777 COAT, Coat/8 for PU COAT.

In specific situations #777 PRIMER and #777 COAT can be replaced by L.A.2S (Adh/3)

For acrylic coating refer to SINIT Technical Sheets:

Coat/12A for FSS COAT PRIMER and Coat/14 for FSS COAT ELASTIC.

## **3 Preliminary conditions**

The following preliminary conditions shall be fulfilled prior to commencement of concrete surface protection works:

- Concrete curing time shall be at least 28 days.
- Concrete surface to be protected shall be clean, without dust and loose material, and any trace of grease. All surfaces, on which no damage repair has taken place, shall be thoroughly washed by water-jet.
- The prepared surfaces shall be inspected visually and taken over in writing prior to commencement of the surface protection works.
- When applying epoxy based solventless protective coating concrete surface moisture content shall not exceed 5% by weight. Surface moisture content shall be measured by means of a GANN TH 85 T, or another approved and calibrated instrument. Where different types of instruments are introduced they shall be mutually calibrated. Gravimetric assessment of concrete moisture content shall be considered as relevant. Moisture content measurements shall be performed both on concrete surface (surface measurement) and at a depth of 2 cm (depth measurement).

- Both substrate and air temperature shall not be less than +5°C and not more than 35°C with 80% maximum admissible relative air humidity.
- During the application of SINIT PU COAT the substrate temperature shall not be less than +10°C. The relative air humidity not to exceed 80%.
- Irrespective of the coating type, the substrate temperature prior to and during application shall be at least 3°C above dew-point temperature of the surrounding air.
- Weather forecast shall be considered prior to commencement of the surface protection works. Fresh paint coats shall be protected from rainfall for a period of at least 24 hours from application. Curing time of the protective coatings depends on ambient temperature, low temperature increase the curing time, high ambient temperatures reduce the curing time. Where necessary, suitable measures shall be taken.

## **4 Instructions for concrete surface protection**

### **4.1 Application of solventless epoxy protective coating based on SINIT's #777 PRIMER and #777 COAT or L.A.2S.**

Conditions of protective coating shall be inspected prior to using. Open or heavily damaged cans shall be rejected.

If the absorption capacity of concrete surface is very low, #777 PRIMER or L.A.2S can be diluted with SINIT OMNIA Solvent by 10% maximum.

SINIT #777 PRIMER or L.A.2S shall be applied by brush or roller and thoroughly rubbed-in on to the concrete surface with a consumption varying from 0.200 to 0.400 kg/m<sup>2</sup> depending on substrate conditions and if application is made on vertical or horizontal members.

Overcoating time for #777 PRIMER or L.A.2S varies from a minimum of 3 hours to a maximum of 12 hours depending on ambient temperatures.

Depending on type of protection required, one or two coats of #777 COAT or L.A.2S shall be applied on #777 PRIMER or L.A.2S by brush, roller or spray equipment with a consumption varying from 0.200 to 0.400 kg/m<sup>2</sup> depending if application is made on vertical or horizontal members.

When a specific high resistance to direct sun exposure, mineral acid, solvents etc...is required, #777 COAT or L.A.2S shall be overcoated with one/two coats of PU COAT with a consumption of about 0.120 – 0.150 kg/m<sup>2</sup> per coat.

### **4.2 Application of water-based acrylic protective coating based on SINIT's FSS COAT PRIMER and FSS CAOT ELASTIC.**

Prior to using the conditions of protective coating shall be inspected. Open or heavily damaged cans shall be rejected.

SINIT FSS COAT PRIMER shall be applied by brush, roller or spray equipment with a consumption varying from 0.125 – 0.150 kg/m<sup>2</sup> depending on substrate absorption.

Overcoating time for FSS COAT PRIMER varies from a minimum of 3 hours to a maximum of 24 hours depending on ambient temperatures.

Two subsequent coats of FSS COAT ELASTIC shall be applied on FSS COAT PRIMER by brush, roller or spray equipment with a consumption varying from 0.200 to 0.250 kg/m<sup>2</sup>.

## **5 Special requirements**

All the aforementioned paint coats may only be applied if climatic requirements are fulfilled: air and substrate temperature, relative air humidity, and dew point shall comply with the maker's specifications.

All the relevant data related to temperatures, humidity, and dew point shall be entered in the construction diary or any other adequate record.

Prior to commencement of applying protective coating, the prepared surfaces shall be taken over by the contractor's Engineer and supervising Engineer. All the findings shall be recorded.

A record of material consumption and of protected surfaces shall be kept as well.

## **6 General requirements**

- Protective coating material shall be stored in a closed room.
- Only originally packed protective coating material may be used. Labels indicating name/type of material and production date shall be clearly readable.
- Protective coatings material shall be stirred by mechanical mixing devices.
- All protective coating material shall be preserved in tightly closed cans.
- When using two-components protective coating mix only the amount that can be used within pot-life.
- Waste paint containers shall be deposited in specially appointed areas.

## **7 Assuring quality of applied materials and executed works**

Both preliminary testing and current quality control of material and works shall be carried out in compliance with the rehabilitation quality assurance programme.