

Method Statement

Nitoflor SL Conductive/Dissipative

Section A : General Comments

High temperature working

It is suggested that, for temperatures above 35°C, the following guidelines are adopted as good working practice:

- (i) Store unmixed materials in a cool (preferably temperature controlled) environment, avoiding exposure to direct sunlight.
- (ii) Keep equipment cool, arranging shade protection if necessary. It is especially important to keep cool those surfaces of the equipment which will come into direct contact with the material itself.
- (iii) Try to avoid application during the hottest times of the day.
- (iv) Make sufficient material, plant and labour available to ensure that application is a continuous process.

Equipment

It is suggested that the following list of equipment is adopted as a minimum requirement :

<i>Protective clothing</i>	:	<i>Protective overalls</i>
	:	<i>Good quality gloves, goggles and face mask</i>
<i>Preparation equipment</i>	:	<i>Suitable equipment/materials to ensure proper preparation of the substrate (see section 1.0)</i>
<i>Mixing equipment</i>	:	<i>1 KW slow + multi-speed drill, (200 and 500 rpm settings),</i>
	:	<i>plus Fosroc mixing paddle and mixing vessel, or</i>
	:	<i>Forced-action mixer, fitted with a suitable paddle</i>
<i>Application equipment</i>	:	<i>Spiked roller and shoes</i>
	:	<i>Spreading trowel or pin screed, chalk</i>
	:	<i>short haired rollers.</i>

Application - points of note

Fosroc operates a policy to encourage the use, where possible, of approved or licensed applicators. This ensures that works are completed satisfactorily so that the long term performance of the materials is assured.

Section B : Application Method

The prevailing relative humidity should not exceed 75% at any stage of the application.

1.0 Surface Preparation

- 1.1 New concrete, or cementitious substrates should be at least 28 days old and have moisture content not exceeding 5%.
- 1.2 Existing concrete floors, which require refurbishment, must be prepared to ensure a strong adhesive bond between the flooring system and the existing floor.
- 1.3 The substrate (new or existing) should be clean, sound and free from contamination such as mortar and paint splashes curing compounds, oil and grease. Excess laitance deposits are best removed by light mechanical scabbling, grinding or grit/captive blasting followed by vacuum cleaning to remove dust debris. All preparation equipment should be of a type approved by Fosroc.
- 1.4 All blowholes, cracks and surface undulations greater than 0.6 mm in depth should be repaired with a proprietary, repair compound - consult the local Fosroc office for specific recommendations.
- 1.5 Oil and grease contamination must be completely removed by grinding down to sound, clean concrete. Alternatively, captive/grit blasting techniques can be used to provide the required substrate.
- 1.6 Where these methods are considered impracticable, alternative methods may be considered but a clean, sound and dry substrate must still result. In particular it is essential that the substrate does not suffer from conditions of rising damp. Any alternative preparations must be approved by Fosroc prior to commencement of work, as the final performance of the system relies upon the performance of sound substrates.

2.0 Priming

- 2.1 Immediately prior to priming, the substrate should be thoroughly cleaned to remove any remaining traces of dust or other loose material
- 2.2 Prepared substrates should be primed using Nitoprime 25. Steel surfaces should be degreased, grit blasted to SA2½ standards and primed with Nitoprime 25
- 2.3 Add the entire contents of the hardener tin to the base tin and mix the two primer components thoroughly for at least 2 minutes - under no circumstances should part mixing be considered.

- 2.4 Once mixed, the primer should be applied immediately to the prepared substrate using stiff brushes and/or rollers. The primer should be well ‘scrubbed’ into the substrate to ensure full coverage, but care should be taken to avoid over application or ‘puddling’.
- 2.5 Allow the primer to dry (see table below) before proceeding to the next stage, do not proceed whilst the primer is ‘tacky’.
- 2.6 Porous substrates may require a second primer coat - when the first coat is directly absorbed into the substrate - but minimum overcoating times must still be observed (see table below).
- 2.7 The minimum overcoating times will vary slightly according to the porosity of the substrate. However, they should be in accordance with the following:

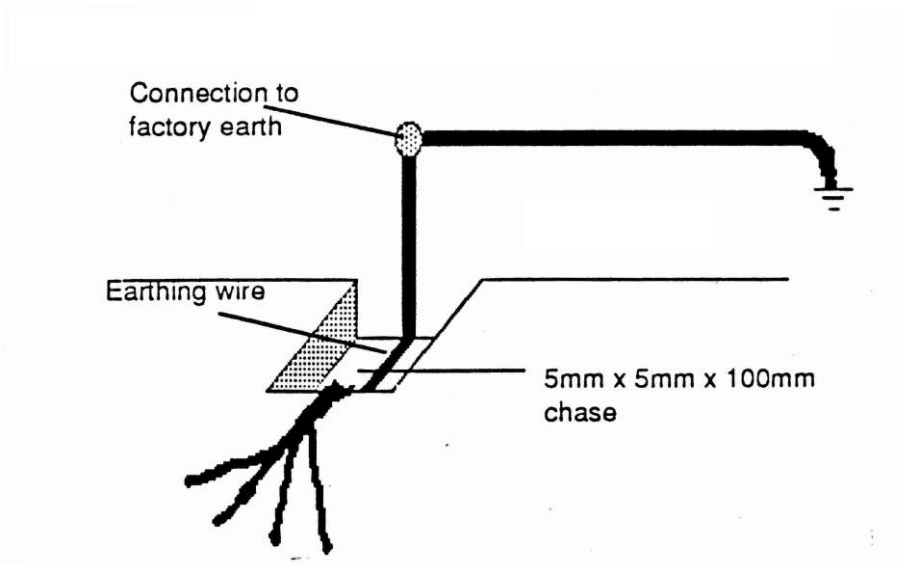
Primer	Ambient temperature at the time of application		
	20°C	30°C	40°C
Nitoprime 25	16 – 24 hours	12 – 24 hours	8 – 16 hours

3.0 Earthing

- 3.1 It is recommended that each individual slab be either connected to each other as shown in Figure 2 by bridging or each individual slab be directed to earth, as shown in Figure 1. The use of copper braid or copper strips is recommended for this purpose.
- 3.2 When required, the following steps should be taken during the preparation/repair stage and subsequently throughout the installation. Below gives the installation sequence to connect to earth and the installation sequence to bridge live joints in the floor.

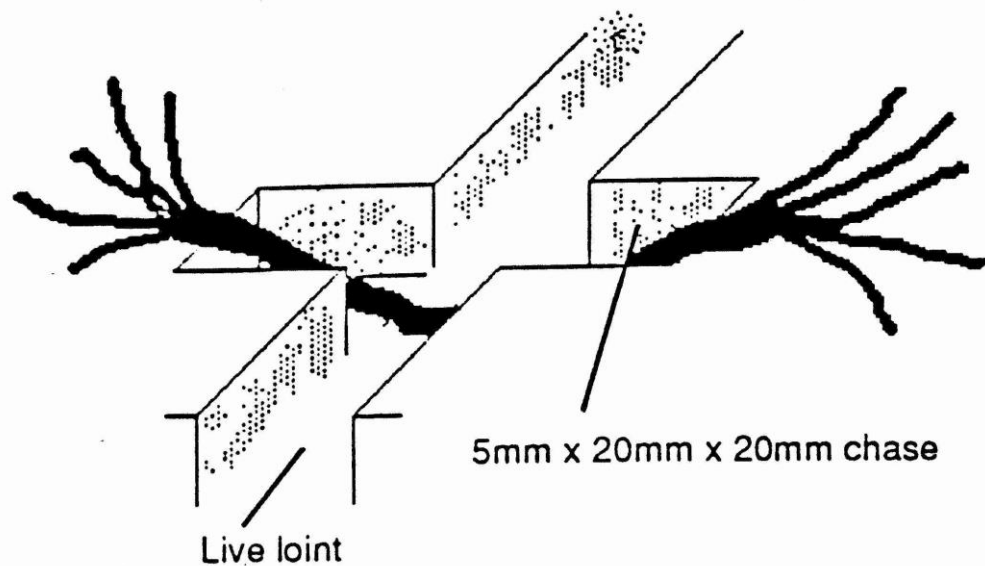
Connection to Earth

- 1) Prime floor surface.
- 2) When primer is dry bond the copper tape to the primed concrete and connect end of the tape to suitable earth point. This will include existing earthing points or copper strips that are themselves connected to the earthing points.
- 3) Overcoat to top of tape with Nitoflor Conductive/Dissipative undercoat during the undercoat installation process.
- 4) When undercoat is dry apply Nitoflor Conductive/Dissipative topcoat.



Bridging live joints where continuous connection is required

- 1) Prime concrete surface as usual.
- 2) Apply copper tape either side of joint ensuring that the tape within the joint is looped at least 20mm below floor level. Fill chase with a suitable repair product.
- 3) Overcoat the exposed copper tape with Nitoflor Conductive/Dissipative undercoat.
- 4) Fill top of joint with closed cell polythene backer rod and overlay joint completely with Nitoflor Conductive/Dissipative topcoat ensuring that path of joints is clearly marked.
- 5) When cured saw cut out topping - replace rod at required depth and seal joint with suitable joint sealant. Drawings of the above can be arranged



4.0 Conductive/Dissipative Undercoat

- 4.1 Nitoflor Conductive / Dissipative undercoat should only be applied within 24 hours of the primer curing. As it is water based adequate ventilation and air movement is essential and care must be taken to avoid installation at temperatures below the relevant dew point (see Appendix 1). Ensure good lighting conditions.
- 4.2 The undercoat should be mixed with a slow speed drill and suitable mixing paddle. The entire contents of the kit are to be mixed for at least 3 mins. Frequently scrape the sides and bottom of the container. When mixed the undercoat should be applied to the primed concrete using a medium hair roller from a roller tray.
- 4.3 Do not pour directly onto the substrate as this may result in occasional patches of thick material, which may then cure poorly.
- 4.4 Do not attempt to roll the undercoat out too far as this can affect the product's electrical properties when installed. On a reasonably smooth substrate, aim to maintain a coverage of about $7\text{m}^2/\text{kg}$. This is best achieved by measuring and marking out the floor in the form of a grid so that the area corresponding to each pack of material is clearly visible.
- 4.5 Use a small (25mm) paintbrush to work the undercoat into any earthing or bridging points (where used) as a good contact is essential at these points.
- 4.6 The undercoat will cure in less than 24 hrs depending upon conditions and is ready to receive the topcoat when a finger drawn across the surface picks up only minimal black traces. At this point, the undercoat should be foot trafficable in clean footwear without exhibiting tack.

- 4.7 When cured to this stage, the resistance to earth as measured by the test method set out in Appendix 2 should be 10^4 ohms or less. This test must be carried out and logged.

5.0 Topcoat

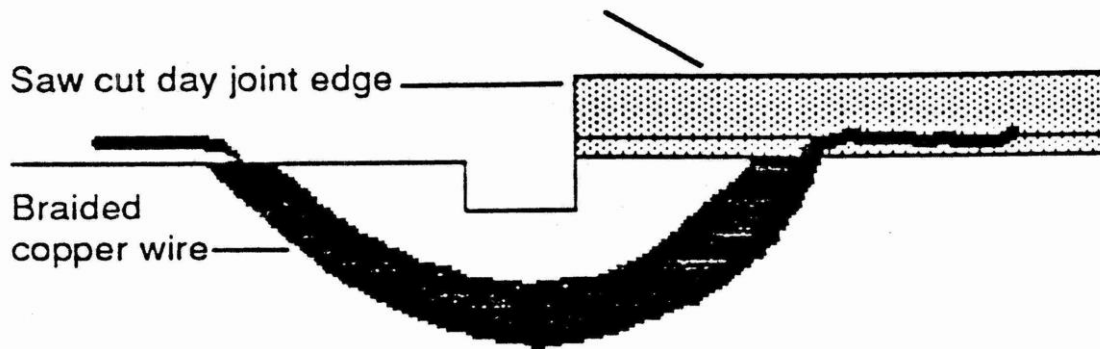
- 5.1 Nitoflor Conductive/Dissipative topcoat is applied in kit form. The kit consists of base, hardener, colour pot and aggregate, which should be mixed together in the base container. We recommend the use of a slow speed mixer. The hardener and colour pot components should be added to the base component in the base tin and mixed until uniform. The aggregate should then be added slowly and the entire kit mixed for a further 3 minutes. High speed mixing is strictly forbidden.
- 5.2 Once mixed, the topcoat should be laid using a trowel, serrated edged trowel or pin screed at a thickness of 2-2.5 mm. Good lighting conditions will assist in enabling any poorly covered areas to be spotted.
- 5.3 The laid product should be rolled using a spiked roller shortly (10 minutes) after application. This first rolling should be at right angles to the direction of laying and should be carried out in a controlled backward/forward motion. About 30 minutes after the first rolling the product should be rolled again at right angles to the first roll. Further rolling may then be carried out to remove any spike shoe marks, minor imperfections as required until just before the product gel point is reached.
- 5.4 Note that, within its open time Nitoflor Conductive/Dissipative cannot be over rolled. Too little attention to rolling can result in surface defects, colour variations and inconsistent conductivity.

6.0 Day Joints

- 6.1 On large floor areas, it may be necessary to incorporate a day joint or leave the laying operation for some days due to project scheduling. When this occurs the floor should be treated as detailed in Figure 3.

Figure 3: Day Joint Design

Nitoflor Conductive topcoat



- 1) Saw cut 5mm wide x 10mm deep transverse chase into floor for a distance of 50mm either side of proposed day joint.
- 2) Bed copper wire or strip into primed floor as shown in Figure 1 & 2, then apply undercoat and topcoat as described to the edge of the day joint. Fill chase as necessary.
- 3) Saw cut the exposed edge of Nitoflor Conductive/Dissipative topcoat when ready to recommence work then apply undercoat and topcoat to the new area as already described. Ensure that the top surface of the copper wire or tape is clean before applying the undercoat.

7.0 Cleaning

- 7.1 During the curing of Nitoflor Conductive/Dissipative topcoat, a thin non-conducting residue may be left on the surface. This should be removed after the product has fully cured using a rotary floor scrubber and a water miscible industrial cleaner.

8.0 Testing

- 8.1 Once cleaned, the total system should be tested for conductivity using the test method laid down in Appendix 2, and the results recorded. The average resistance of the floor to earth when tested by this method should be between 5×10^4 ohms and 10^6 ohms. It is recommended that approx 10 readings are taken per slab

9.0 Floor Maintenance & Repair

It may be necessary, after installation, to repair small areas of the floor which become damaged. When this is required,

- ◆ Saw-cut around the damaged area
- ◆ Hack out the existing floor down to clean concrete
- ◆ Level damaged concrete with Nitomortar S to about 3mm below the existing floor surface
- ◆ Prime the substrate as in section 2
- ◆ Apply Nitoflor Conductive/Dissipative undercoat and topcoat as in previous sections flush with the existing floor surface.

In order to maintain antistatic properties, it is important to implement a regular cleaning regime for the installed product. Cleaning is best carried out using a rotary floor scrubber and water miscible cleaning agents.

Should the client seek advice on polishing the floor surface, we recommend the study of various "topical antistats" for this. Many conventional polishes may interfere with the product's antistatic properties.

APPENDICES

APPENDIX 1 - DEW POINT

The demand for a dry substrate requires the prevention of condensation of moisture from the atmosphere on to the surface to be coated or to the wet film.

In general, care must be taken that the substrate to be treated has a temperature at least 3°C higher than the dew point of the surrounding air.

In the following table, the dew point of air is given in relation to the air temperature and the relative humidity (RH).

TABLE 1 - Dew Point as a function of air temperature and humidity

Air temp °C	Dew Point °C at a RH of								
	50%	55%	50%	65%	70%	75%	80%	85%	90%
5	-4.1	-2.9	-1.8	-0.9	0	0.9	1.8	2.7	3.6
6	-3.2	-2.1	-1	-0.1	0.9	1.8	2.8	3.7	4.5
7	-2.4	-1.3	-0.2	0.8	1.8	2.8	3.7	4.6	5.5
8	-1.6	-0.4	0.8	1.8	2.8	3.8	4.7	5.6	6.5
9	-0.8	0.4	1.7	2.7	3.8	4.7	5.7	6.6	7.5
10	0.1	1.3	2.6	3.7	4.7	5.7	6.7	7.6	8.4
11	1	2.3	3.5	4.6	5.6	6.7	7.6	8.6	9.4
12	1.9	3.2	4.5	5.6	6.6	7.7	8.6	9.6	10.4

13	2.8	4.2	5.4	6.6	7.6	8.6	9.6	10.6	11.4
14	3.7	5.1	6.4	7.5	8.6	9.6	10.6	11.5	12.4
15	4.7	6.1	7.3	8.5	9.5	10.6	11.5	12.5	13.4
16	5.6	7	8.3	9.5	10.5	11.6	12.5	13.5	14.4
17	6.5	7.9	9.2	10.4	11.5	12.5	13.5	14.5	15.3
18	7.4	8.8	10.2	11.4	12.4	13.5	14.5	15.4	16.3
19	8.3	9.7	11.1	12.3	13.4	14.5	15.5	16.4	17.3
20	9.3	10.7	12	13.3	14.4	15.4	16.4	17.4	18.3
21	10.2	11.6	12.9	14.2	15.3	16.4	17.4	18.4	19.3
22	11.1	12.5	13.8	15.2	16.3	17.4	18.4	19.4	20.3
23	12	13.5	14.8	16.1	17.2	18.4	19.4	20.3	21.3
24	12.9	14.4	15.7	17	18.2	19.3	20.3	21.3	22.3
25	13.8	15.3	16.7	17.9	19.1	20.3	21.3	22.3	23.2
26	14.8	16.2	17.6	18.8	20.1	21.2	22.3	23.3	24.2
27	15.7	17.2	18.6	19.8	21.1	22.2	23.2	24.3	25.2
28	16.6	18.1	19.5	20.8	22	23.2	24.2	25.2	26.2
29	17.5	19.1	20.5	21.7	22.9	24.1	25.2	26.2	27.2
30	18.4	20	21.4	22.7	23.9	25.1	26.2	27.2	28.2

Example : Air temperature 20°C, RH 60%: dew point 12.0°C minimum substrate temperature: 12.0 + 3.0 = 15°C

APPENDIX 2 - NITOFLORES CONDUCTIVE / DISSIPATIVE TEST METHODS

Apparatus

Resistance meter having a nominal open circuit voltage of 500 V d.c. and range 10⁴ to 10¹⁰ ohms. Such a meter is a "Megger" made by RS Components Ltd.

Electrode, circular cross section, diameter 60 mm, weighing approximately 1 kg.

Suitable connecting leads.

Paper tissue and plain water.

Aluminium foil

Method

Connect one lead from the meter to a suitable earthing point and the other to the electrode. To ensure good contact between electrode and floor surface, place a moist tissue between the two. Carry out resistance tests at 500 V. We recommend that a minimum of ten such tests should be performed, irrespective of the floor size.

Results

Report results of all the tests and a mean value for the tests.

Satisfactory performance is:

Mean resistance :

Conductive/Dissipative undercoat 10^3 ohms to 5×10^4 ohms

Complete Nitoflor antistatic system 5×10^4 to 10^6 ohms.