

# Nitoflor Hardtop

constructive solutions

## Monolithic surface hardening compound for fresh concrete floors

### Uses

Nitoflor Hardtop provides a highly abrasion resistant surface to fresh concrete floors by the dry shake method which ensures that the hardwearing surface bonds monolithically to the base concrete. It is ideally suited for all industrial areas subjected to heavy traffic, e.g. power stations, heavy industry, agricultural buildings, distillation plants, laboratories, abattoirs, warehouse floors, loading bays and work shops.

### Advantages

- Supplied ready to use - no additives required.
- Provides a hard, abrasion resistant surface.
- Forms monolithic bond with fresh concrete base.
- Hard, dense surface resistant to oils and grease.
- Available in a range of colours to improve working environment.
- Non-metallic aggregate - will not rust when wet.

### Technical support

Fosroc offers a comprehensive range of high performance, high quality flooring, jointing and repair products for both new and existing floor surfaces. In addition, Fosroc offers a technical support package to specifiers, end-users and contractors, as well as on-site technical assistance in locations all over the world.

### Description

Nitoflor Hardtop surface hardening compound is a quality controlled, factory blended powder which is ready to use on site. It consists of special hard wearing aggregates selected for their physical properties of abrasion and wear resistance, Portland cement and special additives to improve workability. This combination produces a material which is easy to trowel in the surface of fresh, wet concrete. Nitoflor Hardtop cures monolithically to provide a dense, non porous surface which is extremely hard wearing and abrasion resistant. Monolithic cure ensures that problems normally associated with thin ('granolithic') screeds, e.g. curling, shrinkage, cracking, etc. are completely overcome.

Nitoflor Hardtop is available in natural (concrete grey) colour as standard. Special colours, including Brick Red, Green and Off-white can be produced on request for large orders.

### Design criteria

#### Base concrete

The base concrete should have a minimum cement content of 300 kg/m<sup>3</sup>. The concrete mix should be designed to minimise segregation and control bleeding, although some limited bleed is desirable to ensure sufficient moisture is available to wet out the Nitoflor Hardtop when it is first applied.

The use of water reducing admixture from the Fosroc Conplast\* range is strongly recommended in order to achieve a water/cement ratio below 0.55. The base concrete should have an on-site slump of between 75 and 100 mm.

The base concrete should be laid and compacted in accordance with good concrete practice, taking care to ensure accurate finished profile and minimum laitance build up. Particular attention should be paid to bay edges and corners to ensure full compaction of the base concrete. See application instructions.

Vacuum dewatering is not recommended.

### Properties

#### Abrasion resistance

The abrasion resistance of Nitoflor Hardtop has been independently tested by the British Board of Agreement. The test using an 'A' Court abrasion-testing machine showed that Nitoflor Hardtop improves the abrasion resistance of concrete by 225%.

#### Compressive strength (to BS1881 Part 116 1983)

At water contents equivalent to those obtained in practical applications, the typical 28 day compressive strength of Nitoflor Hardtop cubes is 70 N/mm<sup>2</sup>.

#### Hardness (Mohs scale)

The selected aggregates contained within Nitoflor Hardtop have a hardness value of 7 on the Mohs original scale.

### Specification clauses

Floors shall be surfaced where shown with Nitoflor Hardtop, a monolithic surface hardening compound containing non-metallic, rust-free aggregates. The aggregate shall have a value not less than 7 on the Mohs original scale and the compound shall have the ability to improve the abrasion resistance of concrete by 225%.

# Nitoflor Hardtop

Nitoflor Hardtop powder shall be applied to the freshly-laid concrete floor by the dry-shake method. It shall be applied at the point where light foot traffic leaves an imprint of about 3 to 6 mm.

The powder shall be applied in two stages, in full accordance with the manufacture's instructions, to achieve an overall application rate not less than 3-5 kg/m<sup>2</sup>. Special attention shall be paid to bay edges in accordance with the manufacturer's written requirements.

## Application instructions

Nitoflor Hardtop should be applied at an even application rate of 3-5 kg/m<sup>2</sup>. It is recommended that the floor be marked off into bays of known area. Sufficient materials should then be laid out to meet the recommended spread rate.

Application of Nitoflor Hardtop should begin without delay when the base concrete has stiffened to the point when light foot traffic leaves an imprint of about 3 to 6 mm. Any bleed water should now have evaporated, but the concrete should have a wet sheen.

On large floors it will be necessary to work progressively behind the laying team to ensure application at the correct time.

Nitoflor Hardtop is applied in two stages.

- a) The first application is broadcast at an even rate of 3 kg/m<sup>2</sup> onto the concrete surface. When the material becomes uniformly dark by the absorption of moisture from the base concrete, this first application can be floated. Wooden floats or, on large areas, a power float, may be used. It is important, however, that the surface is not overworked.
- b) Immediately after floating, the remaining 2 kg/m<sup>2</sup> of Nitoflor Hardtop is applied evenly over the surface at right angles to the first. Again, when moisture has been absorbed the surface can be floated in the same way as before.

Final finishing of the floor using the blades of a power float can be carried out when the floor has stiffened sufficiently so that damage will not be caused.

## Bay edges

Where bay edges are likely to suffer particularly heavy wear or impact and where saw-cut transverse control joints are to be located, it is desirable to give these areas additional protection, by one of the following methods prior to full treatment of the entire surface:

- a) Immediately after levelling the freshly placed concrete, Nitoflor Hardtop should be sprinkled by hand at a rate of 0.3 - 0.5 kg/lin.m (3-5 kg/m<sup>2</sup>) in a strip 100 mm wide along the bay edge and hand-trowelled into the surface.

- b) Immediately after levelling the freshly placed concrete, remove a wedge of the concrete 10 mm deep at the slab edge and tapered up to slab level. Replace this with a very stiff paste of Nitoflor Hardtop, mixed thoroughly with a small amount of water. Ensure it is fully compacted on to the base concrete.

These reinforced areas will be further strengthened when the subsequent full treatment is applied.

Timing of the application of Nitoflor Hardtop is important and care should be taken to ensure adequate labour, machinery and material is available to complete the whole area while sufficient moisture is available to fully react with the powder to provide a good dense finish. Conversely, the full benefit will not be achieved if the material is applied too early when bleed water is still present.

Any addition of water to wet out the surface on either the first or second application of Nitoflor Hardtop will be detrimental to the overall quality of the floor.

Pigmented floors require extra care and need to be protected from damage and staining after completion. It is essential that the correct recommended rate of application is achieved over the entire floor area in order to avoid possible localised variations in shading.

**Note:** It is recommended that Nitoflor Hardtop is applied by an approved Fosroc specialist applicator who has been given detailed training in its use. For further information, please contact your local Fosroc office or representative.

## Cleaning

All equipment should be washed with clean water immediately after use and before the material has hardened.

## Curing

Test have shown that proper curing of concrete floors treated with products such as Nitoflor Emritop, Hardtop & Quartztop\* is essential to ensure the physical properties of the floor.

The most efficient method of curing is to use CONCURE curing membranes which conform to ASTM and DOE specification. However, in indoor applications where curing conditions are less arduous, and breakdown of the membrane slower, alternative approved methods of curing such as polythene sheeting are acceptable.

## Surface treatments

Subsequent surface treatments are not normally necessary with Nitoflor Hardtop because of the high density, low porosity finish. Under standard site conditions a single coat of Nitoflor FC100, where a sealer is required, a two coats of Nitoflor FC100 can be applied, either within 24 hours of the first or at any subsequent time providing the floor surface is dry, clean and free from all contaminants.

# Nitoflor Hardtop

Where a non-slip finish is desired, a single application of Nitoflor FC100 is recommended.

It is important all applications are uniformly applied without thick or ponded areas which will adversely affect the quality of finish.

Nitoflor FC100 should not prevent the bond of a wide range of subsequent treatments (such as Nitoflor FC140) for demarcation lines. However, it is necessary that tests are undertaken to confirm compatibility before application proceeds. For specific advice, consult Fosroc's Technical Service Department.

## Limitations

In particularly aggressive environments, where abrasion resistance of the highest order is required, consideration should be given to the use of Nitoflor Emeritop\*. For guidance contact your local Fosroc office or representative.

Do not use Nitoflor Hardtop in areas exposed to acids and their salts or other materials known to rapidly attack or deteriorate concrete containing Ordinary Portland Cement. Do not apply to concrete containing calcium chloride or concrete having greater than 3% air entrainment.

Where a coloured floor is required, it is strongly recommended that a site trial is undertaken to assess possible local variations caused by aggregates and sands used in the base concrete.

## Estimating

### Supply

The materials are supplied as follows:

<b>Nitoflor Hardtop:</b>	25 kg bags
<b>Nitoflor FC100:</b>	20 litre container or 200 litre drum
<b>Nitoflor FC140:</b>	5 kg pack

### Coverage

<b>Nitoflor Hardtop:</b>	3-5 kg/m <sup>2</sup>
<b>Nitoflor FC100:</b>	5 - 9 m <sup>2</sup> /litre
<b>Nitoflor FC140:</b>	8m <sup>2</sup> /kg

Application should comply with the recommended rate of obtain the published performance characteristics. Any reduction may have a detrimental effect on the finished

floor's abrasion resistance and, in the case of pigmented floors, the quality and consistency of the finish.

The average figures for liquid products are theoretical. Due to the variety and nature of possible substrates, and wastage factors, practical coverage figures will be reduced.

## Storage

If protected from the environment in original undamaged packing, the shelf life of Nitoflor Hardtop, Nitoflor FC100 and Nitoflor FC140 is 12 months. If stored in high temperature and high humidity locations the shelf life may be reduced.

## Precautions

### Health and safety

Nitoflor Hardtop contains cement powders which when mixed or become damp, release alkalis which can be harmful to the skin. Irritating to the eyes, respiratory system and skin. Avoid inhalation of dust. Avoid contact with skin and eyes. Wear suitable gloves and eye protection. In case of contact with skin, wash with water. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Nitoflor FC100 is a solvent based acrylic system. Gloves and barrier creams should be used when handling it. If contact with the skin occurs, a resin removing cream should be used, followed by washing with soap and water. **DO NOT USE SOLVENT.**

The use of goggles is recommended. Direct contact with the eyes will cause irritation and may cause serious eye damage if left untreated. Any eye contamination should be washed thoroughly with plenty of water and immediate medical treatment sought. For further information, see Product Safety Data Sheet.

### Fire

Nitoflor Hardtop is non-flammable.

## Additional information

Nitoflor Hardtop produces an extremely durable and abrasion resistant floor. However, in particularly aggressive environments, where abrasion resistance of the highest order is required, consideration should be given to the use of Nitoflor Emeritop - See separate data sheet.



### Important note:

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard Conditions for the Supply of Goods and Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by it.

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