Fosroc 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 hard wearing surface bonds monolithically to the base concrete. It is ideally suited for all industrial areas subjected to heavy traffic such as:

- Power stations
- Heavy industry
- Agricultural building
- Distillation plants
- Laboratories
- Car parks
- Abattoirs
- Warehouse floors and loading bays
- 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
- Can be coated with different types of epoxy or polyurethane floor systems available in a range of colours to improve working environment.
- Non-metallic aggregate - will not rust when wet

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 emery 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.

Design criteria

Base concrete

The base concrete should have a minimum cement content of 300 kg/m^3. 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 admixtures 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 Instructions for use, Bay edges.

Vacuum dewatering is not recommended.

Properties

Abrasion resistance

The abrasion resistance of Nitoflor Hardtop has been tested using a taber abrasion machine (fitted with 1 Kg, H-22 wheels) showing that Nitoflor Hardtop improves the abrasion resistance of concrete by between 300-500% dependent upon coverage rate.

In accordance with ASTM C944 standard; control concrete mix formed with 357 Kg/m^3 of OPC, water:cement ratio of 0.45 and strength of 60MPa @ 28 days; the improvement is as follows:

Coverage rate of Nitoflor Hardtop (Kg/m^2)	Improvement over control (%)
3	404
4	484

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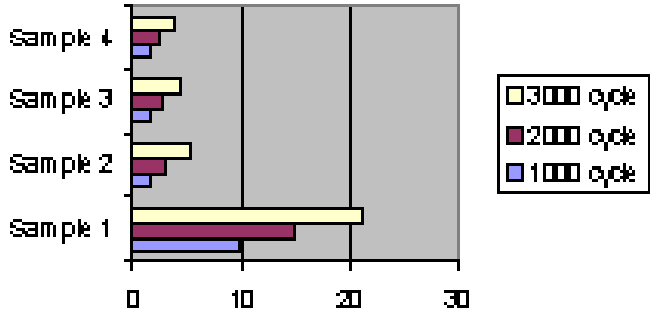
	Coverage rate of N.H. (Kg/m²)	Average weight loss (gm) 1000 cycle	2000 cycle	3000 cycle
Sample 1	0.0	9.87	14.9	21.18
Sample 2	3.0	1.46	2.82	5.24
Sample 3	4.0	1.4	2.61	4.38
Sample 4	5.0	1.37	2.42	3.92



Compressive strength (to BS 1881 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^2.

Hardness (Mohs' scale)

The selected aggregates contained within Nitoflor Hardtop have a hardness value of 8 on the Mohs original scale.

Specification

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 8 on the Mohs original scale and the compound shall have the ability to improve the abrasion resistance of concrete by minimum 300%.

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 3-6 mm.

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

Instructions for use

Nitoflor Hardtop should be applied at an even application rate of between 3-5 kg/m^2 .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 3-6 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 2-3 kg/m^2 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 1-2 kg/m^2 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 0.5 kg/lin.m. (5 kg/m²) 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

Proper curing of concrete floors treated with Nitoflor Hardtop is essential to the physical properties of the finished floor, however, if the floor is to receive further surface treatments please consult your local Fosroc office for advise on recommended curing methods.

For indoor applications where curing conditions are less ardous and breakdown of curing membrane is slower alternative approved methods of curing such as polythene sheets taped at the edges is acceptable.

Surface treatments

Subsequent surface treatments are not normally necessary with Nitoflor Hardtop because of the high density, low porosity finish. Where further treatments are required please consult your local Fosroc office.

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.

Technical support

Fosroc offers a comprehensive technical support service to specifiers, end users and contractors. It is also able to offer on-site technical assistance, an AutoCAD facility and dedicated specification assistance in locations all over the world.

Estimating

Supply

Nitoflor Hardtop	:	25kg bags

Coverage

Nitoflor Hardtop	:	3-5 kg/m²

Applications should comply with the recommended rate to 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 is 12 months.

If stored in high temperature and high humidity locations the shelf life will be reduced.

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Precautions

Health and safety

Nitoflor Hardtop contains cement powders which when mixed or become damp, release alkalis which can be harmful to the skin.

Nitoflor Hardtop is irritating to the eyes, respiratory system and skin. Avoid inhalation of dust and 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.

For further information, see Product Safety Data Sheet.

Fire

Nitoflor Hardtop is non-flammable.

Additional Information

Fosroc manufactures a wide range of complementary products which include :

- waterproofing membranes & waterstops
- joint sealants & filler boards
- cementitious & epoxy grouts
- specialised flooring materials

Fosroc additionally offers a comprehensive package of products specifically designed for the repair and refurbishment of damaged concrete. Fosroc's 'Systematic Approach' to concrete repair features the following :

- hand-placed repair mortars
- spray grade repair mortars
- fluid micro-concretes
- chemically resistant epoxy mortars
- anti-carbonation/anti-chloride protective coatings
- chemical and abrasion resistant coatings

For further information on any of the above, please consult your local Fosroc office - as below.

*** Denotes the trademark of Fosroc International Limited**

† See separate data sheet

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