

# Expanfloor\* Hardtop



CONSTRUCTION CHEMISTRY

**Monolithic surface hardener and dust proofing compound for fresh concrete**

## Uses

Expanfloor\* 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
- Auto industry
- Heavy mechanical industry
- Agricultural building
- Distillation plants
- Car parks
- Abattoirs
- Warehouse floors and loading bays
- Work shops

## Advantages

- Supplied ready to use, dry shake method
- Provides a hard, abrasion resistant surface
- Forms monolithic bond with fresh concrete base
- Hard, dense surface resistant to oils and grease
- Non-metallic aggregate - will not rust while curing or when wet

## Description

Expanfloor\* Hardtop surface hardening compound is a quality controlled, factory blended powder which is ready to use on site. It consists of special hard wearing quartz 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. Expanfloor\* 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.

## Technical support

Expanchem Fospak offers a comprehensive range of high performance, high quality flooring, jointing and repair products for both new and existing floor surfaces. In addition, the company offers a 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.

## 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 Expanfloor\* Hardtop when it is first applied.

The use of water reducing admixtures from the Expanplast\* range is strongly recommended in order to achieve a water:cement ratio below 0.50. 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 Expanfloor Hardtop has been tested using a taber abrasion machine (fitted with 1 Kg, H-22 wheels) showing that Expanfloor 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<sup>3</sup> of OPC, water:cement ratio of 0.45 and strength of 60MPa @ 28 days; the improvement is as follows:

Coverage rate of Expanfloor* Hardtop (Kg/m <sup>2</sup> )	Improvement over control (%)
3	404
4	484
5	540

	Coverage rate of E.H. (Kg/m <sup>2</sup> )	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	1.40	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 Expanfloor\* Hardtop cubes is 70 N/mm<sup>2</sup>.

#### Hardness (Mohs' scale)

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

#### Specification

Floors shall be surfaced where shown with Expanfloor\* 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%.

Expanfloor\* 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<sup>2</sup>. Special attention shall be paid to bay edges in accordance with the manufacturer's written requirements.

#### Instructions for use

Expanfloor\* Hardtop should be applied at an even application rate of between 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 Expanfloor\* 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

Expanfloor\* Hardtop is applied in two stages.

a) The first application is broadcast at an even rate of 2-3 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 1-2 kg/m<sup>2</sup> of Expanfloor\* 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.

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#### 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 leveling the freshly placed concrete, Expanfloor\* Hardtop should be sprinkled by hand at a rate of 0.5 kg/lin.mt. (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 leveling 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 Expanfloor\* Hardtop, mixed thoroughly with a small amount of water. Ensure it is fully compacted on to the base concrete.



CONSTRUCTION CHEMISTRY

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

Timing of the application of Expanfloor\* 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

Any addition of water to wet out the surface on either the first or second application of Expanfloor\* 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 localized variations in shading.

Note: It is recommended that Expanfloor\* Hardtop is applied by an approved Expanchem specialist applicator who has been given detailed training in its use. For further information, please contact your local Expanchem 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 Expanfloor\* 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 Expanchem office for advise on recommended curing methods.

For indoor applications where curing conditions are less arduous 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 Expanfloor\* Hardtop because of the high density, low porosity finish. Where further treatments are required please consult your local Expanchem office.

### Limitations

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

Do not use Expanfloor\* 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.

### Estimating

#### Supply

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**Expanfloor\* Hardtop** : 20 Kg. Bag

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#### Coverage

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**Expanfloor\* Hardtop** : 3-5 Kg. / m<sup>2</sup>

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### Storage

#### Shelf life

Expanfloor\* Hardtop has a shelf life of 12 months if kept in a dry store between 5°C and 30°C in the original, unopened packing.

#### Storage conditions

All products should be stored in accordance with local regulations.



CONSTRUCTION CHEMISTRY

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## Precautions

### Health and safety

Expanfloor\* Hardtop, is alkaline and should not come into contact with skin and eyes. Avoid inhalation of dust during mixing. Gloves, goggles and dust mask should be worn. If contact with skin occurs, wash with water. Splashes to eyes should be washed immediately with plenty of clean water and medical advice sought

\*Denotes the trademark registered.

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