

## General Information



The type of screeding mortar used will depend on the required strength and end use. Levelling screeds are designed for a number of applications and to receive a final flooring, the thickness of the screed is governed by the method of construction being used. To achieve the optimum performance from a levelling screed a high standard of workmanship is essential.

# Screeds

## Definitions

BS EN 13318 defines a screed as: A layer or layers of screed material laid in situ, directly onto a base, bonded or unbonded, or onto an intermediate layer or insulating layer, to obtain one or more of the following purposes:

- to obtain a defined level;
- to carry the final flooring;
- to provide a wearing surface.

BS 8204-1 defines a levelling screed as "a screed suitably finished to obtain a defined level and to receive the final flooring".

A wearing screed is defined as "a screed that serves as a flooring".

Curling is an upward deformation of the edges of a screed.

In situ crushing resistance is defined as the resistance of levelling screeds to the crushing effect of imposed loads and traffic in service, traditionally this was called soundness.

## Standards

BS EN 13813 is entitled "Screed material and floor screeds- Screed material- Properties and requirements, covers both levelling screeds and wearing screeds. This is a performance based standard which does not deal with the specification of constituent materials; it states that materials shall have established suitability.

Definitions for different types of floor screeds, constituent materials and construction terminology related to screeds may be found in BS EN 13318, which is entitled: Screed material and floor screeds- Definitions.

BS 8204 a multi part standard, which has the overall title Screeds, bases and in situ floorings. This standard has seven parts but only four of these are applicable to screeds where cement based materials are/(may be) the binder:

- Part 1 Concrete bases and cementitious levelling screeds to receive floorings;
- Part 2 Concrete wearing surfaces;
- Part 3 Polymer modified cementitious levelling screeds and wearing screeds;
- Part 7 Pumpable self-levelling screeds.

BS 8204 provides guidance on design, material selection, workmanship and testing. Prior to the introduction of BS EN 13813 it was the UK standard screeds were manufactured to. Factory produced screeds are required to conform to BS EN 13813, however screeds produced on a building or construction site are normally manufactured in accordance with the recommendations in BS 8204 which is far more comprehensive than BS EN 13813.

## Cementitious levelling screeds

A levelling screed may be installed for a variety of reasons including:

- to provide a smooth flat surface at the correct level to receive a flooring,
- to provide a finishing zone in which different types of flooring may be accommodated on a common structural base,
- to provide falls,
- to accommodate services, (traditionally screeds have been used as a convenient cover for cables and pipes. These are now

placed in purpose designed ducts which are incorporated into the full depth of the screed.

- to cover and protect thermal/sound insulation,
- to cover and protect a damp proof membrane system,
- to accommodate underfloor heating.

Levelling screeds are classified as

- Bonded: A screed that is bonded to the base,
- Unbonded: A screed laid either onto a separating layer or onto a base not prepared to achieve bonding,
- Floating: A screed laid on an acoustic and/or thermal insulating layer and completely separated from other building elements, such as walls and pipes.

The majority of cement sand levelling screeds consist of a cementitious material, fine aggregate and an admixture. Fine concrete screeds are produced with a maximum aggregate size up to 10mm.

## Types of levelling screed

### Bonded screeds

A bonded screed should have a minimum thickness of 25mm and to accommodate deviations in the base, a thickness of 40mm should normally be specified. Fully bonded screeds have the least risk of cracking, curling and hollowness and is the preferred method of construction where heavy duty usage or a rigid flooring is required. The hardened base concrete must be prepared by mechanical methods to maximise bond.

### Unbonded screeds

An unbonded screed is used where a bond to the base is not possible, such as when the base is contaminated or has an overlain damp proof membrane. An unbonded screed should be of a minimum thickness of 50mm, to allow for deviations in the base a thickness of 70mm should be specified. Curling and hollowness are likely to occur with this form of construction at joints, cracks and perimeters.

### Floating screeds

A floating screed is used where thermal or acoustic insulation is interposed between the

base and screed. The minimum thickness should be 75mm although 65mm is normally considered satisfactory for domestic housing.

### Screed specification

BS EN 13813 is as previously stated a performance based standard it does not cover traditional screed materials supplied in accordance with a traditional prescription or recipe. Cementitious levelling screeds are required to be classified on the basis of both compressive and flexural strength; the standard contains a table listing strength classes as shown in Table 1.

Table 1: Compressive and flexural strength for screeds

Class													
Compressive strength N/mm <sup>2</sup>	5	7	12	16	20	25	30	35	40	50	60	70	80
Flexural strength N/mm <sup>2</sup>	1	2	3	4	5	6	7	10	15	20	30	40	50

This table is applicable to all screed types and the higher strength classes are not relevant for cementitious levelling screeds.

BS 8204-1 contains the statement in Clause 5.6. that ready mixed screeds should conform to the performance requirements of BS EN 13813.

Prior to the introduction of BS EN 13813 screeds were specified in the United Kingdom by prescription. BS 8204-1 recommends nominal proportions by weight of cement to fine aggregate of 1:4 with a lower limit of 1:3 and an upper limit of 1:4.5. The standard states that a screed produced with these material proportions would meet the expected criteria for in situ crushing resistance. It is also stated that a screed with a compressive strength class of C20 or C25 would also meet the in situ crushing requirements.

Where fine concrete levelling screeds are to be laid, the standard recommends that the constituent material proportions should be in the range 1:4 and 1:5 guidance is given on the permissible proportions of fine to coarse aggregates.

## Curing

Screeds should be protected from damage after laying. To achieve the full performance of ready to use levelling screeds adequate curing is essential and the screed should be covered with plastic sheeting or other suitable material to retain moisture for at least five days.

## Testing

The in situ crushing resistance of a screed may be assessed by use of the BRE Screed Tester. This involves dropping a weight of 4kg vertically 1m down a guide onto a hardened steel anvil in contact with the screed surface. The depth of indentation after four blows is measured. The acceptable level of indentation depends on the intended floor usage and the type of floor covering to be applied over the levelling screed. BS 8204-1 gives guidance on indentation depths, it should be noted that a modification to the test weight is required for some floating screeds.

References	
BS 8000-9	Workmanship on building sites. Cementitious levelling and wearing screeds. Code of practice.
BS 8204-1	Screeds, bases and in situ floorings. Part 1 Concrete bases and cement sand levelling screeds to receive floorings: Code of practice.
BS EN 13318	Screed materials and floor screeds - Definitions.
BS EN 13813	Screed materials and floor screeds: Screed material - Properties and requirements.

For a full list of British and European Standards see the MIA data sheet of technical references.



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The Mortar Industry Association is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries

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There is a real danger of contact dermatitis or serious burns if skin comes into contact with wet mortar. Wear suitable protective clothing and eye protection. Where skin contact occurs either directly or through saturated clothing wash immediately with soap and water. For eye contact immediately wash out eyes thoroughly with clean water. If swallowed wash out mouth and drink plenty of water.

The relevant codes of practice, standards and statutory regulations must always be observed.

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