

Screeds, bases and in situ floorings —

Part 7: Pumpable self-smoothing screeds — Code of practice

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- Association of Concrete Industrial Flooring Contractors
- Association of Lightweight Aggregate Manufacturers
- Concrete Society
- Contract Flooring Association
- Federation of Plastering and Drywall Contractors
- Federation of Resin Flooring Formulators and Applicators
- Mastic Asphalt Council
- Mortar Industries Association
- National Federation of Terrazzo — Marble and Mosaic Specialists
- National Specialist Contractors Council
- Quarry Products Association
- Society of Chemical Industry
- Co-opted members

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Foreword

This part of BS 8204 has been prepared by Subcommittee B/507/6. This is a new part and does not revise or supersede any previous versions.

This part of BS 8204 has been written to provide a Code of Practice for the use of pumpable self-smoothing screeds, a type of screed not covered by other parts of BS 8204.

The other parts of BS 8204 are the following:

- *Part 1:2002, Code of practice for concrete bases and cement sand levelling screeds to receive floorings;*
- *Part 2:2002, Code of practice for concrete wearing surfaces;*
- *Part 3:1993, Code of practice for polymer modified wearing surfaces;*
- *Part 4:1993, Code of practice for terrazzo wearing surfaces;*
- *Part 5:1994, Code of practice for mastic asphalt underlay and wearing surfaces;*
- *Part 6:2001, Synthetic resin floorings — Code of practice.*

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 23 and a back cover.

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1 Scope

This part of BS 8204 gives recommendations for materials, design, work on site, inspection and testing of pumpable self-smoothing screeds (often known as “self-levelling screeds”).

NOTE There are two principal types of pumpable self-smoothing screeds, one predominately based on cementitious binders and the other predominately based on calcium sulfate binders.

The recommendations cover the use of pumpable levelling screeds and pumpable wearing screeds in buildings.

As a levelling screed, the screed is intended to receive floor coverings such as:

- a) textiles;
- b) linoleum;
- c) polyvinyl chloride;
- d) rubber;
- e) cork;

or rigid floorings such as:

- f) wood block and strip;
- g) ceramic tiles;
- h) natural stone;
- i) synthetic resin wearing surfaces.

As a wearing screed, the screed is intended to provide a wearing surface itself.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5325, *Installation of textile floor coverings — Code of practice.*

BS 6100-1 (all parts), *Glossary of building and civil engineering terms — Part 1: General and miscellaneous.*

BS 6100-6 (all parts), *Glossary of building and civil engineering terms — Part 6: Concrete and plaster.*

BS 6700, *Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.*

BS 8102, *Code of practice for protection of structures against water from the ground.*

BS 7976-2, *Pendulum testers — Part 2: Method of operation.*

BS 8201, *Code of practice for flooring of timber, timber products and wood based panel products.*

BS 8203, *Code of practice for installation of resilient floor coverings.*

BS 8204-1:2002, *Screeds, bases and in situ floorings — Part 1 Concrete bases and cement sand levelling screeds to receive floorings — Code of practice.*

BS 8204-2, *Screeds, bases and in situ floorings — Part 2: Concrete wearing surfaces — Code of practice.*

BS 8204-6, *Screeds, bases and in situ floorings — Part 6: Synthetic resin floorings — Code of practice.*

CP 102, *Code of practice for protection of buildings against water from the ground.*

3 Terms and definitions

For the purposes of this part of BS 8204 the terms and definitions given in BS 6100-1 and BS 6100-6 and the following apply:

3.1

base

flooring element that provides the support for a screed and floor finishes

3.2

flooring

uppermost fixed layer of a floor that is designed to provide a wearing surface

3.3

direct finished base slab

base that is suitably finished to provide a wearing surface or to receive directly a flooring to be applied without the need for a levelling screed

3.4

screed material

proprietary mixture comprising binder, aggregates, water and, in some cases, admixtures and/or additives

3.5

screed

layer of material laid in situ, directly onto the base, bonded or unbonded, or onto an intermediate layer or insulation layer, for one or more of the following purposes:

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

3.6

levelling screed

screed suitably finished to obtain a defined level and to receive the final flooring

3.7

wearing screed

screed that serves as a flooring

3.8

bonded screed

screed that is bonded to the base

3.9

unbonded screed

screed laid either onto a separating layer or onto a base not prepared to achieve bonding

3.10

floating screed

screed laid on an acoustic and/or thermal insulating layer and completely separated from other building elements, such as walls and pipes

3.11

departure from datum

deviation in height of the surface of a flooring layer from a fixed datum plane

3.12

surface regularity

deviation in height of the surface or a flooring layer over short distances in a local area

3.13**in situ crushing resistance (ISCR)**

resistance of levelling screeds to the crushing effect of imposed loads and traffic in service

NOTE ISCR was formerly known as soundness.

3.14**pumpable self-smoothing screed**

screed that is mixed to a fluid consistency, that can be transported by pump to the area where it is to be laid and which will flow sufficiently (with or without some agitation of the wet material) to give the required accuracy of level and surface regularity

NOTE Pumpable self-smoothing screeds are often known as “self-levelling” screeds.

3.15**flow ring value**

measurement in millimetres that indicates the degree of flow of the wet screed material

4 Exchange of information and time schedule**4.1 General**

To enable each party to have full knowledge of the particulars of the work so that they can co-operate in producing the conditions required to complete a satisfactory job, it is essential that consultations and exchange of information between all parties concerned with the building operations are arranged at an early date.

4.2 Selection of screed to be applied

It is essential that, in the design and construction stages, there should be full consultation with the manufacturer of the proprietary pumpable self-smoothing screed to ensure that the product selected is entirely suited for the conditions both during application and in subsequent service. Consideration should therefore be given to whichever of the following are applicable:

- a) intended use of the floor, including the type, extent and frequency of trafficking;
- b) whether in use the area will be basically dry or permanently damp;
- c) type of flooring to be applied (if any);
- d) type of construction (bonded, unbonded or floating);
- e) thickness of screed required;
- f) time available for the application, curing and drying of the screed;
- g) category of screed and in situ crushing resistance (soundness) required;
- h) class of abrasion resistance and/or slip resistance (for wearing screeds only);
- i) age, specification, where known, and nature of the base;
- j) the existence, or otherwise, of a damp proof membrane;
- k) any information about any previous use that could affect adhesion;
- l) any preparatory treatment required.

4.3 Information to be provided to the screeding contractor

It is essential that all relevant information be provided in good time to those responsible for installing the screed and to others whose work could be affected, including whichever of the following are applicable:

- a) description, situation and address of site and means of access;
- b) those conditions of contract that could practically affect this particular work;
- c) degree of weather protection afforded by the structure;
- d) location and areas of floors to be covered;
- e) age and nature of the base and any preparatory treatment required;
- f) minimum time intervals between stages of work and the application of heat in the building;

- g) date for the completion of preliminary work;
- h) dates for the start and completion of the various sections of the floor;
- i) type of flooring to be laid (for levelling screeds only);
- j) number of layers;
- k) thickness of flooring (for levelling screeds only);
- l) type and thickness of screed;
- m) type of damp-proofing and insulation;
- n) finished screed level and maximum permissible departure from datum;
- o) class (see Table 4) of surface regularity of screed;
- p) any work consequent upon services passing through the floor;
- q) treatment of joints;
- r) treatment of skirtings;
- s) treatment of junctions with adjacent floor and floorings;
- t) type of surface finish;
- u) any requirement for a smoothing compound;
- v) any requirements related to underfloor heating;
- w) details of any compliance testing required;
- x) any other requirements for materials, design or work on site.

4.4 Information to be provided by the screeding contractor

It is essential that the screeding contractor provides, in good time to those responsible for the building, details of the conditions needed for the installation of the flooring, including whichever of the following are applicable:

- a) the extent of areas to be provided for the storage of raw materials and whether these are to be weatherproof or heated;
- b) the extent of areas needed for the siting of mixers and pumps and for access by delivery trucks;
- c) ambient conditions required in the area to be screeded, including information on the degree of weatherproofing, draught-proofing, temperature of the base and the air, humidity, etc.;
- d) power and lighting requirements in the area to be screeded;
- e) power, lighting, water supply and any other service requirements in the screed mixing and pumping area;
- f) minimum time period after the screed is installed before allowing foot traffic and following trades;
- g) protection necessary for the flooring between installation and the laying of floor finishes or final handover.

4.5 Time schedule

In considering the time schedule, in addition to the usual intervals between commencement and completion of work by the various trades involved, allowances should be made for the following:

- a) completion of the building envelope to allow construction of a screed protected from rain, wind and sun;
- b) delays due to frost and cold weather;
- c) laying underfloor services; this should preferably be completed before the base is formed, as there is a risk of subsequent cracking if the services are embedded in the flooring;
- d) curing and drying of the base concrete and/or levelling screed before a flooring is laid (see **6.17**);
- e) period of protection of the screed from damage by other trades, including the period of restriction of access.

5 Materials

5.1 General

Pumpable self-smoothing screeds will be proprietary formulations such that the manufacturer of the screed material is responsible for the formulation, the types, the quality and the correct proportioning and blending of the raw materials.

The formulation will either be for a complete screed material requiring only the addition of water (or a proprietary gauging liquid), or for a complete screed material delivered to the site with the water already added and ready to lay.

There are two principal types of pumpable self-smoothing screeds, one predominately based on cementitious binders and the other predominately based on calcium sulfate binders.

5.2 Water, this should be clean and free from materials deleterious to concrete and screeds in their wet and hardened state. In general drinking water is fit for this use.

5.3 Gauging liquid, a liquid, usually a polymer dispersion, which is to be the material supplied by the screed manufacturer and is to be used as instructed by the manufacturer.

5.4 Reinforcement for crack control, fibres or mesh, alkali resistant if used with cement.

6 Design considerations

6.1 Selection criteria

Most pumpable self-smoothing screeds are designed for use where rapid installation is required in dry, internal locations. The designer and contractor should be aware that the rate of installation of most pumpable self-smoothing screed materials is much quicker than for cement sand screeds. The advantages of pumpable self-smoothing screeds are not realized until relatively large areas can be made available for screeding in one visit. By their nature, they cannot be laid to significant falls.

Cement based pumpable self-smoothing screeds will often be chosen when there is a requirement to lay a thin screed section, when the screed is to be a wearing screed or receive a synthetic resin flooring for an industrial floor, or when quick drying is a requirement.

Calcium sulfate based pumpable self-smoothing screeds will often be chosen when the screed section is to be thicker, when there is a requirement for an unbonded or floating screed or when there is time in the programme for the drying out time required before application of floor finishes. Calcium sulfate screeds are generally not suitable for use as wearing screeds.

On direct-to-ground concrete slabs or on concrete bases that still contain a high level of construction moisture, it is essential that there is suitable protection against rising damp so that the normal drying properties of the screed will be achieved (see **6.16** and **6.17**).

In wet internal locations, where the hardened and dried screed will become wet in service, the material used for the screed and any necessary bonding treatment should be stable and maintain satisfactory strength characteristics when wet. Calcium sulfate based self-smoothing screeds and many rapid drying cement based screeds will be unsuitable in such circumstances. Calcium sulfate is corrosive to steel in damp conditions.

If a designer specifies the use of a thin sheet or tile floor, then the use of a smoothing compound should be specified in certain circumstances (see **7.8.10**).

6.2 Base

The sole function of the pumpable self-smoothing screed is to provide a suitable surface for the application of the flooring or, in the case of a wearing screed, to provide a surface finish appropriate for the intended use. It is not intended to make any contribution to structural performance. The base should therefore be designed independently of the screed to withstand all structural, thermal and mechanical stresses and loads that will occur during service. It should remain stable while covered by the screed and be provided with all necessary expansion, contraction and crack inducement joints to enable it to do so. Failure of the base to remain stable will invariably affect the stability of the finish. In particular, cracking of the base, however caused, is likely to reflect in the screed.