

Screeds, bases and in situ floorings —

Part 5: Mastic asphalt underlays and wearing surfaces — Code of practice

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Association of Lightweight Aggregate Manufacturers
British Cement Association
Concrete Society
Contract Flooring Association
Federation of Plastering and Drywall Contractors
Federation of Resin Flooring Formulators and Applicators
Mastic Asphalt Council
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National Federation of Terrazzo-Marble and Mosaic Specialists
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Foreword

This part of BS 8204 has been prepared by Subcommittee B/507/6.
BS 8204-5:2004+A1:2011 supersedes BS 8204-5:2004, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

Amendment A1 introduces the following principal change.

- Insertion of Annex A on determination of slip resistance of pedestrian surfaces by the ramp/trolley method, alternatively known as the roller coaster method.

Mastic asphalt waterproofing is described in BS EN 12970.

A well-laid mastic asphalt floor of the correct grade provides a hard, durable surface that is easily cleaned and is not inherently slippery. It is able to carry heavy loads, provided that care is taken to avoid static or mobile loads which might cause indentation. It is unaffected by water.

Mastic asphalt flooring is an adaptable material laid either as a wearing surface or as an underlay for decorative floor finishes. When laid as a mastic asphalt waterproofing membrane, it can be used in wet process areas or in areas where washing down is a requirement.

The other parts of BS 8204 are the following:

- Part 1:2003, *Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*;
- Part 2:2003, *Concrete wearing surfaces — Code of practice*;
- Part 3:2004, *Polymer modified cementitious levelling screeds and wearing screeds — Code of practice*;
- Part 4:2004, *Code of practice for terrazzo wearing surfaces*;
- Part 6:2001, *Synthetic resin floorings — Code of practice*;
- Part 7:2003, *Pumpable self-smoothing screeds — 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 cannot 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 22, an inside back cover and a back cover.

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1 Scope

This part of BS 8204 makes recommendations for the types and grades of materials, design, work on site, protection, inspection and testing, maintenance and repair for in situ mastic asphalt for flooring applied as a wearing surface or underlay, incorporating waterproof membranes where required. It is applicable to mastic asphalt applied hot to concrete bases and screeds and concrete suspended floors.

It is intended for mastic asphalt contractors, specifiers, builders and designers, and main contractors.

It gives recommendations for mastic asphalt flooring in buildings applied, as an underlay or as a wearing surface, on a concrete base or screed.

NOTE This part of BS 8204 is intended to be read in conjunction with BS 8204-1.

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 747, *Reinforced bitumen sheets for roofing — Specification*.

BS 1447:1988, *Specification for mastic asphalt (limestone fine aggregate) for roads, footways and pavings in building*.

BS 5284:1993, *Methods of sampling and testing mastic asphalt used in building and civil engineering*.

BS 6100-1.3.3:1987, *Glossary of building and civil engineering terms — Part 1: General and miscellaneous — Section 1.3: Parts of construction works — Subsection 1.3.3: Floors and ceilings*.

BS 6100-2.4.1:1992, *Glossary of building and civil engineering terms — Part 2: Civil engineering — Section 2.4: Highway, railway and airport engineering — Subsection 2.4.1: Highway engineering*.

BS 6925:1988, *Specification for mastic asphalt for building and civil engineering (limestone aggregate)*.

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

BS 8204-1:2003, *Screeds, bases and in situ floorings — Part 1: Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*.

BS 8218:1998, *Code of practice for mastic asphalt roofing*.

BS EN 12970:2000, *Mastic asphalt for waterproofing — Definitions, requirements and test methods*.

BS EN 13318, *Screed material and floor screeds — Definitions*.

BS EN 13813, *Screed material and floor screeds — Screed material — Properties and requirements*.

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS 6100-1.3.3:1987, BS 6100-2.4.1:1992, BS 8204-1:2003 and BS EN 13318 and the following apply.

3.1

coat

layer of mastic asphalt

3.2

rubbing

process by which the last coat of mastic asphalt is given a matt surface finish by the use of clean, dry sand

3.3

spreader

operative skilled in the laying and finishing of mastic asphalt

3.4

float

flat-faced wooden tool with a handle

4 Exchange of information and time schedule

4.1 General

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

4.2 Exchange of information

It is essential that the designer provides in good time all relevant information to those responsible for laying the flooring and to others whose work might 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 which could practically affect this particular work;
- c) location and area of floors to be covered;
- d) age and nature of the base and any preparatory treatment required;
- e) finished floor level and maximum permissible departure from datum;
- f) class or classes of surface regularity required for the bases and the finished mastic asphalt flooring;
- g) any special requirements related to slip resistance;
- h) type of damp-proofing;
- i) type and thickness of screed, if any;
- j) any work consequent upon services passing through the flooring;
- k) treatment of skirtings;
- l) treatment of junctions with adjacent floors and floorings;
- m) type of surface finish;
- n) any special requirements related to underfloor heating;
- o) date for the completion of preliminary work;
- p) dates for the start and completion of various sections of the floor;
- q) details of any conformity testing required;
- r) requirements relating to samples of mastic asphalt for testing purposes;
- s) nature of the final surface, and special finishes required.

4.3 Provision of utilities, facilities and materials

To prevent misunderstanding, particularly at the tendering stage, and to avoid possible situations detrimental to installation, it should be made clear who will be responsible for providing the following:

- a) adequate clean, dry, lockable storage space, protected from frost (if necessary);
- b) a secure storage compound for gas bottles, having a fence not less than 2 m high;
- c) adequate ventilation in confined areas;
- d) adequate artificial lighting, if required;
- e) provision of a suitable level site for the mixer or mixers, blocks of mastic asphalt, and where relevant coarse aggregate, as close as practicable to the work;
- f) unloading and hoisting facilities, if required.

4.4 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) installation of all doors and windows and heating within the building, which is especially relevant to laying grade I flooring (see 5.1.2);
- b) laying of underfloor services; preferably this should be completed before the base is formed as there is a risk of subsequent cracking if services are embedded in the flooring;
- c) curing and drying of the base concrete before the flooring is laid, where appropriate;
- d) cooling and hardening of the flooring;
- e) period of protection of the completed floor from damage by other trades, including restriction of access;
- f) siting of plant.

5 Materials and equipment

5.1 Mastic asphalt

5.1.1 General

The designer should take into account the relevant requirements of BS EN 13813.

CAUTION Molten mastic asphalt should be used with care due to its high temperature.

5.1.2 Properties

The mastic asphalt should be one of the following:

- a) mastic asphalt for flooring of type F1076 of BS 6925:1988;
- b) coloured mastic asphalt for flooring of type F1451 of BS 6925:1988;
- c) mastic asphalt for paving conforming to BS 1447:1988;
- d) mastic asphalt for waterproofing in accordance with BS EN 12970:2000.

Type F1076 and type F1451 mastic asphalt for flooring are graded according to their usage as follows:

- grade I: special hard flooring;
- grade II: light duty flooring;
- grade III: medium duty flooring;
- grade IV: heavy duty flooring.

Type F1076 and type F1451 mastic asphalt do not cover grades of mastic asphalt for special applications such as chemical resistant, or spark free, flooring, for which purposes proprietary variants are available. Type F1076 and type F1451 mastic asphalt are also not suitable for external applications such as loading bays, balconies and rooftop car parks for which paving grade mastic asphalt is specified in BS 1447:1988.

Mastic asphalt supplied cast into blocks suitable for transporting and handling or delivered to the site ready for use in hot-charge transporters should be used.

5.2 Coarse aggregate

Coarse aggregate for grade IV flooring should be clean igneous or calcareous rock or siliceous material conforming to the requirements given in BS 6925:1988, Table 5.

Coarse aggregate for paving grades should be crushed rock conforming to the requirements given in BS 1447:1988, Table 3.

5.3 Separating membrane

The separating membrane should be one of the following:

- a) glass fibre tissue of mass per unit area 50 g/m² to 70 g/m²;
- b) black sheathing felt, conforming to BS 747, comprising a batt of jute fibre impregnated with bitumen.

5.4 Expanded metal lathing

Expanded metal lathing should be bitumen-coated plain expanded metal lathing with an aperture size of not less than 10 mm in the short way of mesh direction and not less than 0.46 mm thick.

5.5 Sand for rubbing

Rubbing sand should be clean, dry sand from natural deposits, predominantly passing a 600 µm test sieve and retained on a 212 µm test sieve, both test sieves conforming to BS 8218:1998.

5.6 High bond primer

A high bond primer, which is a modified synthetic rubber latex dispersion, should be used for application to vertical surfaces to provide a key.

5.7 Float

A float should be used for spreading and finishing the surface of the mastic asphalt.

5.8 Gauges

Gauges, comprising wood or metal strips of the required thickness, should be used as temporary boundaries to bays or elsewhere, to assist the spreader in laying the mastic asphalt.

5.9 Mechanical asphalt mixer

A mechanical asphalt mixer, which is a mobile container, fitted with heating and powered stirrers to provide mechanical agitation, should be used for the purpose of re-melting mastic asphalt prior to laying.

5.10 Mastic asphalt cauldron

As an alternative to a mechanical asphalt mixer, a mastic asphalt cauldron, which is a cylindrical steel vessel fitted with a fire-box, may be used at the site for the purpose of re-melting mastic asphalt prior to laying. Generally, a mastic asphalt cauldron is not mechanically agitated.

5.11 Heated dumper

A heated dumper truck with an insulated container and mechanical agitation may be used for the transportation of molten mastic asphalt up to the point of laying.

5.12 Hot-charge transporter

A hot-charge transporter fitted with a heater and mechanical agitation should be used for the delivery of ready-for-use mastic asphalt to site.

6 Design

6.1 Selection of grades of mastic asphalt flooring

Factors influencing the selection of grades of mastic asphalt flooring should be considered at an early stage in the design and should include the following:

- a) the constructional form of the base on which the flooring is to be laid, e.g. ground supported slab, suspended floor, or screed;
- b) any falls or drainage facilities required;
- c) the means of providing a transition from one level to another particularly at thresholds;
- d) features such as details of finishing against other materials or floor finishes laid to falls;
- e) provision of a waterproofing layout;
- f) the type and intensity of traffic anticipated;
- g) details of any fixtures or fittings, particularly where these are fixed into the base and penetrate the asphalt;
- h) the use including loading, rates of travel, type and width of tyre of any wheeled conveyances, e.g. fork-lift trucks, trolleys;

- i) the weights of standing loads, their bearing area and any point loading;
- j) the anticipated ambient temperature within the building;
- k) maximum and minimum temperatures, and any other conditions likely to affect the performance of the flooring either during laying or in service;
- l) any exposure of the mastic asphalt to acids, oils, greases or other substances and their concentration and temperature;
- m) details of the mastic asphalt flooring surface required, e.g. level of slip resistance or need for ease of cleaning;
- n) details of floor finishes to be applied to a mastic asphalt underlay and the adhesive to be used.

The effects of some of these factors are interrelated, e.g. loads and temperatures. For specific conditions, advice should be sought from the mastic asphalt manufacturer.

A guide to the selection of the appropriate grade of flooring and recommended thicknesses for various applications is given in Table 1.

6.2 Base to receive mastic asphalt

6.2.1 General

Surfaces to which mastic asphalt is to be applied should be installed or prepared so as to have a true and even surface substantially free from irregularities such as abrupt changes in levels, hollows, ridges, dips, fins, and concrete, mortar or plaster droppings. The building design should, therefore, be such that the mastic asphalt can be applied at a uniform thickness.

6.2.2 Concrete bases

Concrete bases to receive mastic asphalt directly should be designed and constructed following the recommendations in BS 8204-1:2003. The surface should be provided with a float finish, and a surface regularity of SR2, or as necessary for the finished surface. Any falls required should be formed in the base.

Any damp-proof membrane and/or thermal insulation should be placed below the concrete base slab.

Adequate end and side restraint should be provided to precast concrete beams and similar units in order to reduce their structural movement to a minimum.

6.2.3 Screeds

Cement sand and fine concrete screeds should be designed and laid following the recommendations given in BS 8204-1. The in situ crushing resistance (ISCR) of the screed should be at least category B when tested in accordance with the method given in BS 8204-1:2003, Annex C.

The surface should be provided with a float finish, and a surface regularity of SR2, or as specified by the designer for the finished surface. Any falls required should be formed in the base supporting the screed.