

Specification for

Dry packaged cementitious mixes —

Part 1: Prepacked concrete mixes

UDC [691.54:621.798]:691.32

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| Confirmed December 2009 |
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Cooperating organizations

The Cement, Gypsum, Aggregates and Quarry Products Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

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| Association of Consulting Engineers | Department of Transport* |
| Association of County Councils | Federation of Civil Engineering Contractors* |
| Association of Metropolitan Authorities | Federation of Stone Industries |
| Autoclaved Aerated Concrete Products Association | Gypsum Products Development Association |
| British Precast Concrete Federation Ltd.* | Institute of Quarrying |
| British Quarrying and Slag Federation* | Institution of Civil Engineers |
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| Cement Admixtures Association* | Institution of Structural Engineers* |
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| Department of the Environment (PSA)* | Sand and Gravel Association Limited* |
| Department of the Environment (Transport and Road Research Laboratory)* | Society of Chemical Industry* |

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

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| Association of Lightweight Aggregate Manufacturers | Electricity Supply Industry in England and Wales |
| Cementitious Packaged Products Association† | Mortar Producers' Association Ltd.† |
| Concrete Block Association† | Co-opted member.† |
| County Surveyors' Society | |

This British Standard, having been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee, was published under the authority of the Executive Board and comes into effect on 29 February 1980

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The following BSI references relate to the work on this standard:
Committee reference CAB/4
Draft for comment 78/10939 DC

Amendments issued since publication

| Amd. No. | Date of issue | Comments |
|----------|---------------|----------|
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ISBN 0 580 11145 8

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Foreword

This British Standard has been produced under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee. It covers factory produced dry mixes of cement, aggregates and, when used, admixtures which are supplied in packages for the do-it-yourself and retail trades. It is intended that the contents of these packages should be mixed on site with the only addition being water.

Part 1 of the standard covers prepacked concrete mixes of two grades; coarse concrete mixes containing aggregate of a nominal maximum size of 20 mm and fine concrete mixes containing aggregate of a nominal maximum size of 10 mm.

Part 2 of the standard covers prepacked cement : lime : sand mortar mixes, and cement : sand mortar mixes for brick-laying, screeding and other building purposes.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 5838 specifies, for the do-it-yourself and retail trades, the materials to be used, the methods of describing the grades of concrete, the physical requirements of packaging materials, identification of contents and sampling and testing to determine compliance with this standard.

2 References

The titles of the publications referred to in this Part of this standard are listed on the inside back cover.

3 Definitions

For the purposes of this Part of BS 5838 the following definitions apply.

prepacked concrete mixes

a prepacked mixture consisting substantially of cement and aggregate requiring only mixing with water before use

volume yield

the volume of a wet mix of workable consistence obtained from a unit mass of dry material

4 Constituent materials

4.1 Cement. The cement shall be ordinary or rapid-hardening Portland cement complying with the requirements of BS 12 or Portland blastfurnace cement complying with the requirements of BS 146.

4.2 Aggregates. Aggregates shall comply with the requirements of BS 882, BS 1201, BS 1047 or BS 3797.

4.3 Admixtures. When admixtures are used they shall comply with the requirements of BS 5075-1 and BS 5075-2.

4.4 Chloride. The chloride ion content shall be not greater than 0.05 % of the mass of the contents of the package.

5 Preparation of aggregates

All aggregates, before mixing with the other constituents, shall have a moisture content of less than 0.5 % by mass when tested in accordance with the requirements of 7.3 of BS 812-2:1975.

6 Types and properties of concrete mixes

6.1 Aggregate sizes. The concrete shall be described as coarse when the nominal maximum size of aggregate is 20 mm and as fine when the nominal maximum size of the aggregate is 10 mm.

6.2 Compressive strength. The compressive strength at 28 days shall be determined as detailed in clause 9 and shall be not less than 20 N/mm².

6.3 Volume yield. The volume yield shall be determined as detailed in clause 9 and shall be not less than 95 % of the nominal volume yield indicated on the package. It shall be reported as the volume of concrete in m³ produced per unit package.

7 Packaging

7.1 Identification and marking. Identification and marking of packages shall include the following particulars.

- a) The number of this British Standard, i.e. BS 5838-1.
- b) Product description.
- c) Mass and nominal volume yield.
- d) Description of any admixture.
- e) Indication of health and safety requirements.
- f) Advice on storage.
- g) The name, trademark or other means of identification of the manufacturer or vendor.
- h) Advice on use and mixing.

7.2 Package construction. The strength of the package shall be adequate to contain the mass of dry concrete mix for which it is intended.

The material from which the packages are made shall have water vapour transmission not greater than 20 g/m² in 24 h as determined in accordance with the requirements of BS 3177. This requirement shall not apply to packages of less than 5 kg.

8 Sampling

When testing is called for, a combination of whole packages having a total mass of not less than 50 kg for every 10 tonne of package supplied shall be submitted for testing in accordance with the requirements of clause 9.

9 Testing

9.1 General. All sampling, curing and testing of the fresh or hardened concrete shall be carried out in accordance with the requirements of BS 1881.

9.2 Preparation of sample. The sample, when received in the laboratory, shall be rendered homogeneous and, if necessary, be reduced in size by coning and quartering, or by any other suitable sampling means, to about 25 kg.

9.3 Mixing of sample. The weighed, prepared sample (see 9.2) shall be machine mixed for not less than 2 min with the amount of water required to give the specified slump.

9.4 Workability and water requirement. The workability of the concrete shall be measured by the slump test specified in BS 1881-2 and shall be between 50 mm and 75 mm. If the slump is less than 50 mm then further water may be added and mixed in to reach the required workability. If the slump is more than 75 mm the test shall be repeated with a new prepared sample as specified in 9.2, using less water. The amount of water to achieve the required workability shall be recorded as the water requirement and expressed as a percentage by mass of solid ingredients to the nearest 0.1 %.

9.5 Volume yield. Immediately after completion of the slump test, the wet bulk density of the fresh concrete shall be determined to the nearest 10 kg/m³ in accordance with the requirements of BS 1881-2. The volume yield per unit package shall then be calculated to the nearest 0.0001 m³ from the formula:

$$V = \frac{(R \times 0.01 \times W) + W}{D}$$

where

V is the volume yield per unit package (m³)

W is the mass of unit package (kg)

R is the water requirement as determined in 9.4 (%)

D is the wet bulk density (kg/m³).

9.6 Making and curing of test cubes. The same concrete shall be used as specified in 9.4. The size of test cubes shall be 100 mm and they shall be made and cured in accordance with the requirements of BS 1881-3, except that three cubes shall be retained from the same batch for test at 28 days age.

9.7 Testing of cubes. The cubes shall be tested for compressive strength in accordance with the requirements of BS 1881-4 and the average of three cubes taken from the same batch and reported to the nearest 0.5 N/mm² shall be the test result.

Publications referred to

- BS 12, *Specification for ordinary and rapid-hardening Portland cement.*
- BS 146, *Portland-blastfurnace cement.*
- BS 812, *Methods for sampling and testing of mineral aggregates, sands and fillers.*
- BS 812-2, *Physical properties.*
- BS 882, BS 1201, *Aggregates from natural sources for concrete (including granolithic).*
- BS 1047, *Specification for air-cooled blastfurnace slag coarse aggregate for concrete.*
- BS 1881, *Methods of testing concrete.*
- BS 1881-2, *Methods of testing fresh concrete.*
- BS 1881-3, *Methods of making and curing test specimens.*
- BS 1881-4, *Methods of testing concrete for strength.*
- BS 3177, *Method for determining the permeability to water vapour of flexible sheet materials used for packaging.*
- BS 3797, *Specification for lightweight aggregates for concrete.*
- BS 5075, *Concrete admixtures.*
- BS 5075-1, *Accelerating admixtures, retarding admixtures and water-reducing admixtures. Metric units.*
- BS 5075-2, *Air entraining admixtures¹⁾.*

¹⁾ In course of preparation.

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