

Testing concrete

Part 131. Methods for testing cement in a reference concrete

ICS 91.100.10

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/517, Concrete, to Subcommittee B/517/1, Concrete production and testing, upon which the following bodies were represented:

- Association of Lightweight Aggregate Manufacturers
- British Cement Association
- British Civil Engineering Test Equipment Manufacturers' Association
- British Precast Concrete Federation Ltd.
- Cement Admixtures Association
- Cementitious Slag Makers' Association
- Chartered Institution of Water and Environmental Management
- Construction Confederation
- County Surveyors' Society
- Department of the Environment, Transport and the Regions
- Department of the Environment, Transport and the Regions (Building Research Establishment)
- Federation of Piling Specialists
- Institute of Concrete Technology
- Institution of Structural Engineers
- National House-building Council
- Quarry Products Association
- Society of Chemical Industry
- United Kingdom Quality Ash Association

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 May 1998

© BSI 07-1999

The following BSI references relate to the work on this standard:
Committee reference B/517/1
Draft for comment 96/109327 DC

ISBN 0 580 28689 4

Amendments issued since publication

Amd. No.	Date	Text affected
10470	July 1999	Indicated by a sideline in the margin

Contents

Committees responsible	Page
Foreword	Inside front cover
Method	ii
1 Scope	1
2 References	1
3 Definitions	1
4 Principle	1
5 Apparatus and materials	1
6 Proportioning	1
7 Temperature and humidity conditions	2
8 Procedure for mixing	2
9 Testing the concrete	2
10 Report	3
Annexes	
A (normative) Coarse aggregate	6
B (normative) Sand	6
C (informative) Alternative mixing	9
Tables	
1 Batch masses	2
2 Temperature and humidity conditions	2
3 Ages for strength tests	3
4 Dimensions	4
A.1 Coarse aggregate grading	6
B.1 Composition of mortar	7
Figures	
1 Typical rotating pan concrete mixer	4
2 Suitable trowel	5
B.1 Grading of sand fractions for concrete cubes	8

Foreword

This Part of BS 1881 has been prepared by Subcommittee B/517/1. It supersedes BS 4550 : Part 4 : 1978 and BS 4550 : Part 5 : 1978 which are withdrawn. It also supersedes clause 1 of BS 4550 : Section 3.4 : 1978.

The transfer of this test to BS 1881 allows its continued use in assessing the strength produced by a cement in a specified concrete. A procedure for mixing concrete based on that used in BS 1881 : Part 125 has been introduced as the reference procedure for mixing in this Part of BS 1881. The procedure described in BS 4550 : Section 3.4 has been retained in this standard as an alternative procedure to allow comparison with previous tests (see annex C).

It has become common practice to measure the slump of the concrete produced for this test to assess the effect of the cement on consistence. A procedure has been added to this standard (see 9.1).

It has been shown that deviations from the specified raw materials, mixer, mixing procedure and curing conditions affect the slump result. As it may not always be possible to use the apparatus and materials specified in this British Standard, substitution of other apparatus and materials is permitted, but any such deviation should be reported detailing, where possible, the effect of the deviation.

A British Standard does not purport to include all necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Summary of pages

This document contains a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

The BSI copyright notice displayed throughout this document indicates when the document was last issued.

Method

1 Scope

This British Standard gives methods for testing cement in a reference concrete. It includes provisions for the laboratory conditions, the mixer, materials and mix proportions together with the procedures for mixing and testing the concrete.

2 References

2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the publications apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this standard the definitions given in BS 1881 : Part 102, Part 108, Part 111, Part 114, Part 115, Part 116 and Part 125 apply.

4 Principle

A concrete is made with the cement to be tested, using specified constituent materials in specified proportions and mixed by machine. The consistence of the concrete is determined by its slump and its strength is measured by compressive strength tests on 100 mm concrete cubes.

5 Apparatus and materials

5.1 *Cube moulds*, of 100 mm size conforming to BS 1881 : Part 108.

5.2 *Concrete mixer*, comprising a rotating mixer pan with a contra-rotating mixing paddle and a scraper blade. The dimensions and tolerances shall be as shown in figure 1.

The mixing pan shall rotate at (18 ± 1) r/min. The mixing paddle (offset from the pan centre) shall rotate at (90 ± 5) r/min.

The mixing paddle and scraper blade shall be spring loaded to ensure they do not jam during mixing. Simple and positive means of vertical adjustment shall be provided on the mountings of the mixing paddle and scraper blade.

The mixer shall either be fitted with an automatic timing device or a stop clock shall be provided.

5.3 *Slump cone*, conforming to BS 1881 : Part 102.

5.4 *Slump rod*, conforming to BS 1881 : Part 102.

5.5 *Slump baseplate*, conforming to BS 1881 : Part 102.

5.6 *Slump scoop*, conforming to BS 1881 : Part 102.

5.7 *Trowel*, having a cast steel blade.

NOTE. A suitable type is shown in figure 2.

5.8 *Compacting equipment*, either a compacting bar, a vibrating hammer or a vibrating table in accordance with 3.3 of BS 1881 : Part 108 : 1983.

5.9 *Curing tank*, conforming to BS 1881 : Part 111.

NOTE. Specimens made with high alumina or super sulfated cements should not be placed in the same tank as specimens made with Portland cements.

5.10 *Balance*, capable of weighing to the nearest 1 g.

5.11 *Compression testing machine*, of suitable capacity for the test conforming to BS 1881 : Part 115.

NOTE. The lower limit of verification for the scale range used should be below the expected maximum load on any specimen tested on the scale range.

5.12 *Coarse aggregate*, conforming to the requirements of annex A.

5.13 *Sand*, conforming to the requirements of annex B.

5.14 *Water*, deionized or distilled.

6 Proportioning

The masses of the individual materials for batches of sufficient volume to produce three, six, nine or 12 cubes are given in table 1.