

Specification for

Masonry cement

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/516, Cement and lime, to Subcommittee B/516/10, Masonry cement, upon which the following bodies were represented:

- Brick Development Association
- British Aggregate Construction Materials Industries
- British Cement Association
- British Lime Association
- British Precast Concrete Federation
- Cementitious Slag Makers' Association
- Department of the Environment (Building Research Establishment)
- Mortar Producers' Association
- Quality Ash Association

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Foreword

This British Standard has been prepared by Technical Committee B/516. It is a revision of BS 5224:1976 to align closely with developments in the work of Technical Committee 51, Cement and building limes, of the European Committee for Standardization (CEN), which has prepared a European Standard for masonry cements in two Parts; ENV 413-1 which is a specification and EN 413-2 which covers test methods. The UK is obliged to implement EN 413-2 by the withdrawal of test methods in BS 5224. As a consequence, this British Standard specifies requirements based on tests in BS EN 413-2 and Parts of BS EN 196. It supersedes BS 5224:1976 which is withdrawn.

This revision is based on ENV 413-1 in the same way as the 1991 revision of BS 12 was based on ENV 197-1. This will prepare the way for the future implementation of EN 413-1 as a replacement for BS 5224.

This revision covers a wider range of types and compositions of masonry cements than BS 5224:1976. Significant changes in the manner in which they are specified are introduced. Three strength classes are defined on the basis of 28-day mortar strength. Non air-entrained masonry cements are included for the first time in the UK for two of the three strength classes.

The strength class in this standard equivalent to BS 5224:1976 is MC 12.5 (with air-entraining agent). There is no experience in the UK of other strength classes or of non air-entrained masonry cements which have not previously been manufactured in this country. Under UK climatic conditions class MC 5 would be considered unsuitable for external masonry and non air-entrained classes MC 12.5X and MC 22.5X would be considered to be more susceptible to the action of freezing and thawing.

This revision uses the concept of characteristic values for the various specified requirements. These are related to a defined sampling and testing procedure by the cement manufacturer (autocontrol). The conformity criteria for the autocontrol system are given in Annex A. The sampling plan sets out the minimum testing frequencies and results of these tests are used to assess conformity. This serves to define the quality and characteristics of the masonry cement. In addition to characteristic values, an additional series of limiting values is defined. Sampling plans for cement manufacturer's autocontrol are given in Annex B and acceptance inspection recommendations are given in Annex C.

This revision introduces the following changes.

- a) It is a specification only and supporting test methods are described in BS EN 413-2 and Parts of BS EN 196.
- b) The masonry cement is still based on Portland cement clinker but with lower permitted clinker contents which are related to strength class rather than to type of addition i.e. minimum 40 % clinker for classes MC 12.5, MC 12.5X and MC 22.5X and minimum 25 % clinker for class MC 5. These compositional changes may affect durability and, in the absence of long term experience in the UK, a test for durability, based on sulfate attack and freeze/thaw, is being developed within CEN.
- c) A 90 μm sieve residue has been introduced as a fineness limit.
- d) The test for setting times is essentially unchanged but their minimum values have been increased.
- e) Fresh mortar properties are still measured on test mortars of standard consistence. The penetration value of (35 ± 3) mm by the reference plunger method is equivalent to a dropping ball value of (10.0 ± 0.5) mm.
- f) The air content and water retention of the test mortar are more tightly defined.

- g) There is no specified requirement for workability but Annex E suggests suitable values for workability (cohesiveness at standard consistence). The test is based on flow times measured by the workability meter described in BS EN 413-2. In view of the limited experience with this method an alternative method using the flow table as in BS 5224:1976 is being developed.
- h) The sulfate limit of not more than 3.0 % of the total cement for classes MC 12.5 and MC 22.5 has the same value as in BS 5224:1976 but is now based on autocontrol. However, a limit of 3.5 % is permitted if the clinker content is greater than 55 %. There is a 2.0 % limit for class MC 5.
- i) A chloride limit has been introduced for classes MC 12.5, MC 12.5X and MC 22.5X.
- j) Standard 28-day compressive strength is now measured on prisms made from mortar in accordance with BS EN 196-1 and this defines the strength classes. There is a 7-day strength requirement for classes MC 12.5, MC 12.5X and MC 22.5X.
- k) The cement test certificate, available on request, is now to include results of tests on strength, initial setting time, soundness, sulfate content, chloride content, air content and water retention (see Annex D).
- l) Guidance on the use of masonry cement and safety precautions have been introduced in Annex F.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS EN ISO 9000.

Enquiries as to the availability of third party certification schemes are forwarded by BSI to the Association of British Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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

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Summary of pages

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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.