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Cement — Test methods — Determination of strength

Ciments — Méthodes d'essai — Détermination de la résistance mécanique

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 679 was prepared by Technical Committee ISO/TC 74, *Cement and lime*.

This second edition cancels and replaces the first edition (ISO 679:1989), which has been technically revised as follows, based on comments received by the Secretariat.

a) The testing procedure has been revised with respect to hardness and surface texture of moulds (4.6.3) and compression strength testing machine platens (4.6.6) as supplied; suitability of mould oil (4.6.3); frequency of operation of jolting apparatus (4.6.4); and the inclusion and accuracy of a balance (4.6.8); deionized water (5.3) is now permitted; procedures for mixing mortar (6.2) and the moulding (Clause 7) and conditioning (Clause 8) of test specimens have been revised to reflect current best practice.

b) Test results (Clause 10) are now reported in megapascals, replacing newtons per square millimetre. (One megapascal is equivalent to one newton per square millimetre.)

c) The use of a flexural strength testing machine (4.6.5) is now optional.

d) Estimates of the precision for compressive strength testing (10.2.3) have been revised to include both short- and long-term repeatability together with reproducibility data for laboratories of “normal” performance and an indication of precision data for “expert” laboratories.

e) The procedure for validation testing of ISO standard sand (11.2) includes initial qualification testing, validation criteria, verification testing and annual confirmation testing.

f) The procedure for validation testing of alternative compaction equipment (11.3) has been revised and a normative annex (Annex A) has been introduced detailing two alternative vibration compaction equipments which have been validated.

Cement — Test methods — Determination of strength

1 Scope

This International Standard specifies a method of determining the compressive and, optionally, the flexural strength of cement mortar containing one part by mass of cement, three parts by mass of ISO standard sand and one half part of water. The method applies to common cements and to other cements and materials, the standards for which call up this method. It might not apply to other cement types that have, for example, a very short initial setting time.

This International Standard describes the reference equipment and procedure, and specifies the method used for validation testing of ISO standard sands and of alternative equipment and procedures.

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.

ISO 1101, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 4200, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length*

ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

3 Principle

The method is comprised of a determination of the compressive, and optionally the flexural, strength of a prismatic test specimen 40 mm × 40 mm × 160 mm in size.

These specimens are cast from a batch of plastic mortar containing one part by mass of cement, three parts by mass of ISO standard sand and one half part of water (water/cement ratio of 0,50). ISO standard sands from various sources and countries may be used, provided that they have been shown to give cement strength results that do not differ significantly from those obtained using the ISO reference sand (see Clause 11).

In the reference procedure, the mortar is prepared by mechanical mixing and is compacted in a mould using a jolting apparatus. Alternative compaction equipment and procedures may be used provided that they have been shown to give cement strength results that do not differ significantly from those obtained using the reference jolting apparatus and procedure (see Clause 11 and Annex A). In the event of a dispute, only the reference equipment and procedure shall be used.