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Second edition
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Testing of concrete —

Part 6: Sampling, preparing and testing of concrete cores

Essais du béton —

Partie 6: Échantillonnage, préparation et essais sur des carottes de béton

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and prestressed concrete*, Subcommittee SC 1, *Test methods for concrete.*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This second edition cancels and replaces the first edition (ISO 1920-6:2004), which has been technically revised.

The main changes compared to the previous edition are as follows:

— requirements of compressive testing machine have been included and defined;

— Clause 5 has been redrafted;

— accuracy requirements at the time of measuring core diameter, core length have been redefined;

— tolerances of the prepared test specimen have been redefined;

— the curing of test specimens under tropical climate has been included and defined.

A list of all parts in the ISO 1920 series can be found on the ISO website.

Testing of concrete —

Part 6:
Sampling, preparing and testing of concrete cores

1 Scope

This document specifies a method for taking cores from hardened concrete, their examination, preparation for testing and determination of compressive strength.

This document does not give guidance on the decision to drill cores or on the locations for drilling and does not provide procedures for interpreting the core strength results.

It is recommended that before coring, full agreement should be reached by all parties on the need for core testing and how the results should be interpreted.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1920-4, *Testing of concrete — Part 4: Strength of hardened concrete*

ISO 1920-5, *Testing of concrete — Part 5: Density and water penetration depth*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
core strength
compressive strength of the cored specimen, as determined by the test defined in this document

4 Apparatus

4.1 Core drill, capable of extracting cores from the hardened concrete to the dimensions specified in 5.3 with the tolerances specified in Clause 7.

4.2 Compression testing machine

4.2.1 The test shall be carried out using a compression-testing machine which shall be robust, related to the size of specimen and capable of providing rate of loading with minimum desired specifications the place of testing.

4.2.1.1 Accuracy of the test machine shall be such that the percentage error for the loads within proposed range of use of the machine and shall not exceed ±1,0 % of the indicated load.

4.2.1.2 The compression testing machine shall be provided with a control system. The control system can be operated either by manual or automatic means. If the machine is not equipped with automatic application of force, a pacer shall be fitted to enable the operator to maintain the specified rate. The pacer shall indicate a rate within ±5,0 % of the specified rate.

4.2.1.3 Machine platens and auxiliary platens shall have a hardness value at least 550 HV (Vickers Hardness).

4.2.1.4 The thickness of the auxiliary platens shall be at least 23 mm with roughness value, *Ra*, for the surface texture of the contact faces of the auxiliary platen shall be in the range 0,4 µm to 3,2 µm.

4.2.2 The test machine shall be in calibration at the time of test. The calibration shall be carried out at least once per year.

4.3 **Balance** or **scale**, capable of determining the mass of the core, as tested, to within an accuracy of 0,1 % of the mass.

4.4 **Callipers** and/or **rules**, capable of measuring the dimensions of the core and the steel reinforcement to a tolerance of ±0,01 mm.

4.5 **Gauge**, capable of establishing that the relevant flatness of the specimen is within the requirements of Clause 7.

4.6 **Squares** and **gauges**, capable of establishing that the perpendicularity and parallelism of specimens and moulds are within the requirements of Clause 7.

5 Taking of cores

5.1 Age of concrete

Core to be tested for strength shall not be removed from the structure until the concrete has become hard enough to permit its removal without disturbing the bond between the mortar and the coarse aggregate. As a general guideline, concrete with specified or characteristics compressive strength up to 25 MPa, such concrete can be at least 14 days old before the cores are taken. For higher grades, cores may be taken at an earlier age.

5.2 Location

Possible structural implications resulting from taking a core shall be considered prior to drilling and the location where the cores are to be taken specified.

Cores shall preferably be taken at points not near to joints or edges of the concrete element to avoid as far as possible any reinforcement.