
International Standard



4111

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Fresh concrete — Determination of consistency — Degree of compactibility (Compaction index)

Béton frais — Détermination de la consistance — Degré de compactibilité

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Descriptors : concrete, fresh concrete, tests, mechanical tests, compacting, measurement, consistency.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4111 was developed by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, and was circulated to the member bodies in September 1977.

It has been approved by the members bodies of the following countries:

Austria	Germany, F.R.	Portugal
Belgium	India	Romania
Bulgaria	Israel	South Africa, Rep. of
Canada	Italy	Spain
Chile	Korea, Rep. of	Switzerland
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	USA
Egypt, Arab Rep. of	Norway	USSR
France	Philippines	Yugoslavia

The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

Fresh concrete — Determination of consistency — Degree of compactibility (Compaction index)

1 Scope and field of application

Dimensions in millimetres

This International Standard specifies a method for the determination of the consistency of fresh concrete by evaluating the degree of compactibility.

This method is considered applicable to concrete of every consistency except very fluid concrete. It is not applicable to concrete having a maximum aggregate size exceeding 40 mm.

2 References

ISO 2736, *Concrete — Sampling, making and curing of test specimens.*¹⁾

ISO 4109, *Fresh concrete — Determination of consistency — Slump test.*¹⁾

ISO 4110, *Fresh concrete — Determination of consistency — Vebe test.*¹⁾

3 Apparatus

3.1 Container, having smooth and sufficiently stiff side walls, made of a material which is not readily attacked by the cement paste, with base dimensions of 200 ± 2 mm \times 200 ± 2 mm and a height of 400 ± 2 mm.

The container may be replaced by a 200 mm cubic mould. A filling frame may be used to attain a height of 400 mm.

3.2 Trowel (see figure 1), to be used for filling the container.

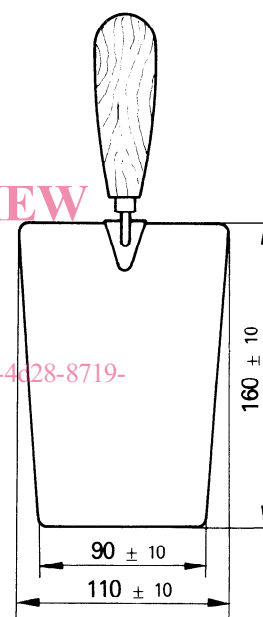


Figure 1 — Trowel

1) At present at the stage of draft.

3.3 Device for compacting the concrete, consisting of either a vibrating table or a vibrating rod with a diameter not exceeding 40 mm.¹⁾

4 Sampling

The sample of fresh concrete used for determining the degree of compactibility shall be representative of the entire batch. It shall be obtained in accordance with ISO 2736.

5 Procedure

5.1 Thoroughly clean the inner surface of the container and moisten it if the concrete is to be used after the test, or cover it with a thin film of oil. Fill the container with concrete, without tamping it, by tilting the trowel sideways from all four upper edges of the container in turn. When the container is filled, carefully remove all concrete above the upper edges in such a way as to avoid any compacting effect.

5.2 Compact the concrete by means of a vibrating table or vibrating rod until no further reduction in volume is determinable. During compaction no loss of concrete shall occur through spouting or leakage.

5.3 After compaction, determine the value of *s* (see figure 2) to the nearest millimetre, i.e., the mean value of the distance between the surface of the compacted concrete and the upper edge of the container. This value is obtained by measuring at the four corners of the container. If an uneven concrete surface forms during vibration it shall be levelled by tamping before taking measurements.

6 Expression of results

The degree of compactibility (compaction index) is given by the formula

$$\frac{h_1}{h_2} = \frac{h_1}{h_1 - s}$$

where

*h*₁ is the internal height of the container (i.e. 400 ± 2 mm);

*h*₂ is the height, in millimetres, of the compacted concrete;

s is the mean value, in millimetres, of the distance from the surface of the compacted concrete to the upper edge of the container.

7 Test report

The test report shall include the following information :

- a) reference to this International Standard;
- b) date of the test;
- c) identification of the sample;
- d) degree of compactibility (compaction index).

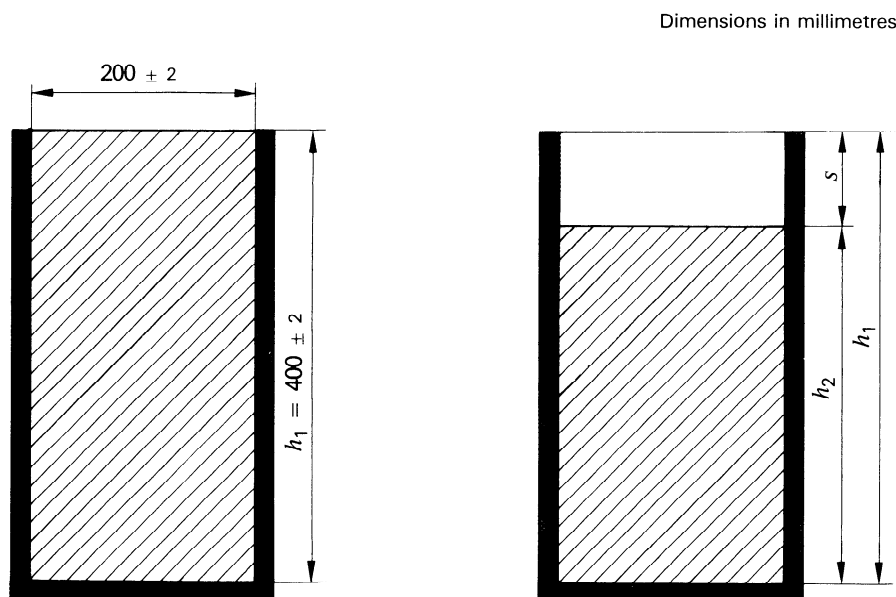


Figure 2 — Concrete in container, before and after compaction

1) Other means of compaction such as a tamping rod as described in ISO 4109 or ISO 4110 may exceptionally be used if complete compaction is achieved.