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Testing of concrete —

Part 12: Determination of the carbonation resistance of concrete — Accelerated carbonation method

Essais du béton —

Partie 12: Détermination de la résistance du béton à la carbonation — Méthode de carbonation accélérée

Reference number
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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.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 1, *Test methods for concrete*.

ISO 1920 consists of the following parts, under the general title *Testing of concrete*:

— *Part 1: Sampling of fresh concrete*

— *Part 2: Properties of fresh concrete*

— *Part 3: Making and curing test specimens*

— *Part 4: Strength of hardened concrete*

— *Part 5: Properties of hardened concrete other than strength*

— *Part 6: Sampling, preparing and testing of concrete cores*

— *Part 7: Non-destructive tests on hardened concrete*

— *Part 8: Determination of drying shrinkage of concrete for samples prepared in the field or in the laboratory*

— *Part 9: Determination of creep of concrete cylinders in compression*

— *Part 10: Determination of static modulus of elasticity in compression*

— *Part 11: Determination of the chloride resistance of concrete, unidirectional diffusion*

— *Part 12: Determination of the carbonation resistance of concrete — Accelerated carbonation method*

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Introduction

Ferrous steel reinforced concrete structures need to be durable to ensure that the intended service life is achieved. The corrosion of reinforcement induced by carbonation can play a significant role in the serviceability of a structure and consequently carbonation resistance of concrete is an important property to measure. This International Standard sets out a test method that may be applied to cast test specimens to assess the potential carbonation resistance properties of a concrete mix.

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Testing of concrete —

Part 12: Determination of the carbonation resistance of concrete — Accelerated carbonation method

1 Scope

This procedure is a method for evaluating the carbonation resistance of concrete using an accelerated carbonation test. After a period of preconditioning, the test is carried out under controlled exposure conditions using an increased level of carbon dioxide to which, the vertical sides of the specimen are exposed.

The test results are not designated to set performance requirements but to compare the carbonation resistance of different concretes of the same strength class, which are used in the same environmental conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1920-2, *Testing of concrete — Part 2: Properties of fresh concrete*

ISO 1920-3, *Testing of concrete — Part 3: Making and curing test specimens*

ISO 1920-4, *Testing of concrete — Part 4: Strength of hardened concrete*

3 Terms and definitions

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

3.1
depth of carbonation
depth as measured using a phenolphthalein solution sprayed on a freshly-split concrete surface

3.2
single point carbonation depth
depth of carbonation measured at a single point on a specimen, $d_{k,point}$

3.3
specimen face carbonation depth
mean depth of carbonation of a single exposed face of a single specimen, $d_{k,face}$

3.4
specimen carbonation depth
mean depth of carbonation of a single specimen, $d_{k,spec}$

3.5
mean carbonation depth
mean depth of carbonation of two specimens, d_k

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