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Admixtures for concrete

Adjuvants pour 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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 3, *Concrete production and execution of concrete structures*.

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Admixtures for concrete

1 Scope

This document specifies definitions and requirements for admixtures for use in concrete in accordance with ISO 22965.

This document does not specify provisions governing the practical application of admixtures in the production of concrete, i.e. requirements concerning composition, mixing, placing, curing, etc. of concrete containing admixtures.

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 680, *Cement — Test methods — Chemical analysis*

ISO 758, *Liquid chemical products for industrial use — Determination of density at 20 °C*

ISO 1158, *Plastics — Vinyl chloride homopolymers and copolymers — Determination of chlorine content*

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

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

ISO 4316, *Surface active agents — Determination of pH of aqueous solutions — Potentiometric method*

ISO 12439, *Mixing water for concrete*

ISO 22965-1, *Concrete — Part 1: Methods of specifying and guidance for the specifier*

ISO 22965-2, *Concrete — Part 2: Specification of constituent materials, production of concrete and compliance of concrete*

BS 8443, *Specification for establishing the suitability of special purpose concrete admixtures*

EN 480-1, *Admixtures for concrete, mortar and grout — Test methods — Part 1: Reference concrete and reference mortar for testing*

EN 480-2, *Admixtures for concrete, mortar and grout — Test methods — Part 2: Determination of setting time*

EN 480-4, *Admixtures for concrete, mortar and grout — Test methods — Part 4: Determination of bleeding of concrete*

EN 480-5, *Admixtures for concrete, mortar and grout — Test methods — Part 5: Determination of capillary absorption*

EN 480-6, *Admixtures for concrete, mortar and grout — Test methods — Part 6: Infrared analysis*

EN 480-8, *Admixtures for concrete, mortar and grout — Test methods — Part 8: Determination of the conventional dry material content*

EN 480-10, *Admixtures for concrete, mortar and grout — Test methods — Part 10: Determination of water soluble chloride content*

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EN 480-11, *Admixtures for concrete, mortar and grout — Test methods — Part 11: Determination of air void characteristics in hardened concrete*

EN 480-12, *Admixtures for concrete, mortar and grout — Test methods — Part 12: Determination of the alkali content of admixtures*

EN 480-14, *Admixtures for concrete, mortar and grout — Test methods — Part 14: Determination of the effect on corrosion susceptibility of reinforcing steel by potentiostatic electro-chemical test*

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:

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

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

3.1 General definitions

3.1.1
performance
ability of an admixture to be effective in its intended use without detrimental effects

3.1.2
compliance dosage
dosage of an admixture, expressed in % by mass of cement or binder, stated by the manufacturer which will meet the requirements of this document

Note 1 to entry: The compliance dosage is within the recommended range of dosage.

3.1.3
recommended range of dosage
dosages between limits expressed in % by mass of cement or binder which the manufacturer recommends for the product based on experience on site

Note 1 to entry: The use of the recommended dosage does not imply that compliance with this document will be met over the whole range. Trial tests should be carried out with the materials to be used on site to find the dosage necessary to achieve the required result.

3.1.4
maximum recommended dosage
upper limit of the recommended range of dosage

3.1.5
reference concrete and mortar
concrete and mortar as specified in Annex B for testing admixtures for conformity with this document

3.1.6
multifunction admixture
admixture which affects several properties of fresh and/or hardened concrete by performing more than one of the main functions defined in 3.2.2 to 3.2.9

3.1.7
primary function
single function of a multifunction admixture designated by the manufacturer

3.1.8
secondary function
function of a multifunction admixture which is additional to the primary function

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3.1.9
binder
cement or combinations of cement and additions of type II

3.2 Specific definitions

3.2.1
admixtures for concrete
material added during the mixing process of concrete in a quantity not more than 5 % by mass of the cement content of the concrete, to modify the properties of the mix in the fresh and/or hardened state

3.2.2
water reducing/plasticizing admixture
admixture which without affecting the consistence, permits a reduction in the water content of a given concrete mix, or which, without affecting the water content increases the workability/consistency or produces both effects simultaneously

3.2.3
high range water reducing/super plasticizing admixture
admixture which, without affecting the consistence, permits a high reduction in the water content of a given concrete mix, or which, without affecting the water content increases the workability/consistency considerably, or produces both effects simultaneously

3.2.4
water retaining admixture
admixture which reduces the loss of water by a reduction of bleeding

3.2.5
air entraining admixture
admixture which allows a controlled quantity of small, uniformly distributed air bubbles to be incorporated during mixing which remain after hardening

3.2.6
set accelerating admixture
admixture which decreases the time to commencement of transition of the mix from the plastic to the rigid state

3.2.7
hardening accelerating admixture
admixture which increases the rate of development of early strength in the concrete, with or without affecting the setting time

3.2.8
set retarding admixture
admixture which extends the time to commencement of transition of the mix from the plastic to the rigid state

3.2.9
water resisting admixture
waterproof admixture
admixture which reduces the capillary absorption of hardened concrete

3.2.10
set retarding/water reducing/plasticizing admixture
admixture which produces the combined effects of a water reducing/plasticizing admixture (primary function) and a set retarding admixture (secondary function)

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3.2.11
set retarding/high range water reducing/superplasticizing admixture
admixture which produces the combined effects of a high range water reducing/superplasticizing admixture (primary function) and a set retarding admixture (secondary function)

3.2.12
set accelerating/water reducing/plasticizing admixture
admixture which produces the combined effects of a water reducing/plasticizing admixture (primary function) and a set accelerating admixture (secondary function)

3.2.13
slump and air retentions/high range water reducing/air entraining admixture
admixture that enable reduction in the water content, while providing slump and air retentivity, without affecting the consistence

3.2.14
viscosity modifying admixture
admixture incorporated in concrete to limit segregation by improving cohesion

3.2.15
antiwashout admixture
admixture that significantly reduces the washout of cement during underwater placing and hardening of concrete

3.2.16
antifreezing admixture
admixture which allows concrete to set and develop compressive strength at temperatures below freezing

4 Requirements

4.1 General requirements

The requirements in this document assume that admixtures are uniformly dispersed in concrete; special attention shall be given to the dispersion of powder admixtures with retarding effects.

All admixtures defined in 3.2.2 to 3.2.16 shall conform the general requirements in Table 1, Clause 5 and Clause 6.

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