INTERNATIONAL STANDARD

ISO 22873

First edition
2021-04

Quality control for batching and mixing steel fibre-reinforced concretes

Contrôle qualité pour le dosage et le mélange des bétons armés de fibres d'acier

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ISO 22873:2021
https://standards.iteh.ai/catalog/standards/iso/60a6ccfb-eebb-4198-8a94-91478dcbcb48/iso-22873-2021

Reference number
ISO 22873:2021(E)

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Published in Switzerland

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This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 6, *Non-traditional reinforcing materials for concrete structures*.

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Quality control for batching and mixing steel fibre-reinforced concretes

1 Scope

This document specifies the principles and procedures to secure quality control of steel fibre-reinforced concretes (SFRC) during batching and mixing procedures to deliver to a purchaser with the ingredients uniformly mixed, and that can be sampled and tested at the point of delivery.

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 13270, *Steel fibres for concrete — Definitions and specifications*

3 Terms and definitions

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For the purposes of this document, the terms and definitions given in ISO 13270 and the following 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/

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3.1
slump
distance from the top of the slumped concrete to the level of the top of the slump cone.

3.2
workability
property measure of the ease of moulding or shaping an unshaped concrete.

3.3
segregation
separation of aggregate and fines during fabrication of a concrete to leave a honeycomb appearance and/or a layer of excess fines.

3.4
fibre balling
bunch of fibres sticking together during fibre integration in the concrete mix.

3.5
steel fibres
straight or deformed pieces of cold-drawn steel wire, straight or deformed cut sheet fibres, melt extracted fibres, shaved cold-drawn wire fibres and fibres milled from steel blocks which are suitable to be homogenously mixed into concrete or mortar.

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4 Materials

4.1 Steel fibres

4.1.1 Classification

Five general groups of steel fibres in accordance with ISO 13270 are identified in this document based on the product or process used as a source of the steel fibre material.

a) Group I: cold-drawn wire

b) Group II: cut sheet

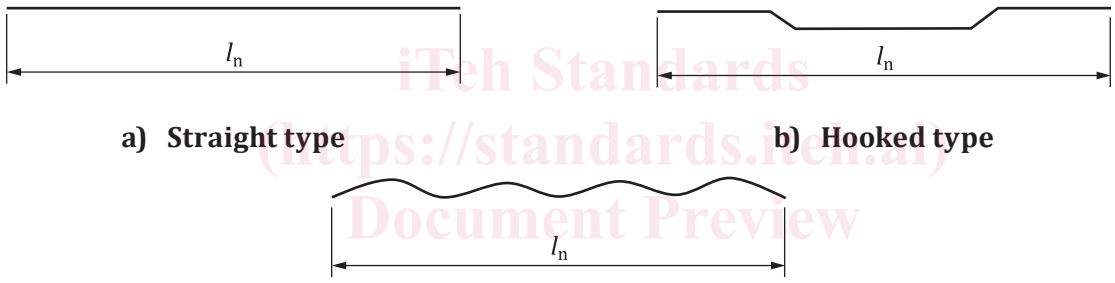
c) Group III: melt-extracted

d) Group IV: shaved cold-drawn wire

e) Group V: milled from blocks

4.1.2 Shape

Fibres shall be straight or deformed.



a) Straight type **b) Hooked type**

c) Crimped type

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Key

l_n nominal length of fibre

Figure 1 — Steel fibre types

4.2 Admixture

a) Calcium chloride and chlorides from other sources should be limited to lower than 0,3 kg/m^3. The amounts should be lower than 0,6 kg/m^3 when permitted by purchaser approval.

b) Both chemical and mineral admixtures are suitable in steel fibre-reinforced concretes (SFRC) and are commonly used.

c) Air-entraining admixtures are recommended for SFRC exposed to freezing and thawing conditions.

4.3 Storage of fibres

Care should be taken to see that steel fibres are stored in a manner that prevents their deterioration or the intrusion of moisture or foreign matter. If fibres deteriorate or become contaminated, they should not be used.

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