SLOVENSKI STANDARD
SIST EN ISO 13383-1:2016

01-junij-2016

Nadomešča:
SIST EN 623-3:2002

Fina keramika (sodobna keramika, sodobna tehnična keramika) - Značilnosti mikrostrukture - 1. del: Določanje velikosti zrn in porazdelitve velikosti (ISO 13383-1:2012)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Microstructural characterization - Part 1: Determination of grain size and size distribution (ISO 13383-1:2012)

Hochleistungskeramik - Mikrostrukturelle Charakterisierung - Teil 1: Bestimmung der Korngröße und der Korngrößenverteilung (ISO 13383-1:2012)

Céramiques techniques - Caractérisation microstructurale - Partie 1: Détermination de la grosseur du grain et de la distribution granulométrique (ISO 13383-1:2012)

Ta slovenski standard je istoveten z: **EN ISO 13383-1:2016**

ICS:

81.060.30	Sodobna keramika	Advanced ceramics

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EUROPEAN STANDARD

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EN ISO 13383-1

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ICS 81.060.30

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English Version

Fine ceramics (advanced ceramics, advanced technical ceramics) - Microstructural characterization - Part 1: Determination of grain size and size distribution (ISO 13383-1:2012)

Céramiques techniques - Caractérisation microstructurale - Partie 1: Détermination de la taille et de la distribution des grains (ISO 13383-1:2012)

Hochleistungskeramik - Mikrostrukturelle Charakterisierung - Teil 1: Bestimmung der Korngröße und der Korngrößenverteilung (ISO 13383-1:2012)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

The text of ISO 13383-1:2012 has been prepared by Technical Committee ISO/TC 206 “Fine ceramics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 13383-1:2016 by Technical Committee CEN/TC 184 “Advanced technical ceramics” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

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Endorsement notice

The text of ISO 13383-1:2012 has been approved by CEN as EN ISO 13383-1:2016 without any modification.

INTERNATIONAL STANDARD

ISO 13383-1

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Fine ceramics (advanced ceramics, advanced technical ceramics) — Microstructural characterization —

Part 1: Determination of grain size and size distribution

Céramiques techniques — Caractérisation microstructurale — Partie 1: Détermination de la grosseur du grain et de la distribution granulométrique

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 13383-1 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

ISO 13383 consists of the following parts, under the general title *Fine ceramics (advanced ceramics, advanced technical ceramics) — Microstructural characterization*:

— *Part 1: Determination of grain size and size distribution*

— *Part 2: Determination of phase volume fraction by evaluation of micrographs*

Fine ceramics (advanced ceramics, advanced technical ceramics) — Microstructural characterization —

Part 1:
Determination of grain size and size distribution

1 Scope

This part of ISO 13383 describes manual methods of making measurements for the determination of grain size of fine ceramics (advanced ceramics, advanced technical ceramics) using photomicrographs of polished and etched test pieces. The methods described in this part do not yield the true mean grain diameter, but a somewhat smaller parameter depending on the method applied to analyse a two-dimensional section. The relationship to true grain dimensions depends on the grain shape and the degree of microstructural anisotropy. This part contains two principal methods, A and B.

Method A is the mean linear intercept technique. Method A1 applies to single-phase ceramics, and to ceramics with a principal crystalline phase and a glassy grain-boundary phase of less than about 5 % by volume for which intercept counting suffices. Method A2 applies to ceramics with more than about 5 % by volume of pores or secondary phases, or ceramics with more than one major crystalline phase where individual intercept lengths are measured, which can optionally be used to create a size distribution. This latter method allows the pores or phases to be distinguished and the mean linear intercept size for each to be calculated separately.

NOTE A method of determining volume fraction(s) of secondary phase(s) can be found in ISO 13383:2; this will provide a means of determining whether Method A1 or Method A2 should be applied in borderline cases.

Method B is the mean equivalent circle diameter method, which applies to any type of ceramic with or without a secondary phase. This method may also be employed for determining grain aspect ratio and a size distribution.

Some users of this part of ISO 13383 may wish to apply automatic or semiautomatic image analysis to micrographs or directly captured microstructural images. This is permitted by this part provided that the technique employed simulates the manual methods (see Clause 4 and 8.4).

2 Normative references

The following referenced documents are indispensable for the application 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/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

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

3.1
grain size
size of the distinct crystals in a material, and for the purposes of this method of test, that of the primary or major phase

3.2
mean linear intercept grain size
g_{mli}
average value of the distance between grain boundaries as shown by randomly positioned lines drawn across a micrograph or other image of the microstructure

3.3
equivalent circle grain diameter
d_{ci}
diameter of a circle which closely matches the perimeter of a grain

See Figure 1.

3.4
maximum (Feret) grain size
$d_{ci,\,max}$
maximum dimension of a grain viewed in two dimensions

See Figure 1.

NOTE This is also termed maximum caliper diameter in ASTM E930.

3.5
maximum orthogonal grain size
$d_{ci,\,perp}$
for the purposes of determination of grain aspect ratio, the largest dimension of a grain normal to its maximum (Feret) grain dimension, viewed in two dimensions

See Figure 1.

3.6
grain aspect ratio
ratio of maximum (Feret) grain size to the maximum orthogonal grain size measured perpendicular to it