
**Microbeam analysis — Electron
backscatter diffraction —
Measurement of average grain size**

*Analyse par microfaisceaux — Diffraction d'électrons rétrodiffusés —
Mesurage de la taille moyenne des grains*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 202, *Microbeam analysis*.

This second edition cancels and replaces the first edition (ISO 13067:2011), which has been technically revised. The main changes compared to the previous edition are as follows:

- Data from a round robin ([Annex B](#)) have been used to:
 - Include information on expected precision ([Clause 7](#) and [Annex B](#));
 - Include more detail on sources of errors ([Clause 7](#));
 - Clarify statements on minimum numbers of grains measured ([5.8](#)) and acceptable clean up procedures ([6.3–6.3](#));
 - Clarify the distinction between sectional grain size measured on a 2D section and average grain size determined from some 2D measurements of grain sections which can be related by stereology to the 3D grain size;
 - Additionally, improvements have been made to the description of calculation of average values ([6.5](#)) and representation of the data ([6.6](#)).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The mechanical and electromagnetic properties of engineering materials are strongly influenced by their crystal grain size and distribution. For example, strength, toughness and hardness are all important engineering properties that are strongly influenced by these parameters. Both bulk materials and thin films, even as narrow two-dimensional structures, are influenced by grain size. For this reason, it is important to have standard methods for its measurement with commonly used and agreed terminology. This document describes procedures for measuring average grain size from maps of local orientation measurements using electron backscatter diffraction.

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