
**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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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Terminology associated with EBSD measurement of grain size	2
3.2 Terminology associated with grains and grain boundaries determined via EBSD	4
3.3 Terminology associated within grain size measurement	5
3.4 Terminology associated with data correction and uncertainty of EBSD maps	6
4 Equipment for grain sizing by EBSD	7
4.1 Hardware requirements	7
4.2 Software requirements	7
5 Acquiring the map for grain sizing by EBSD	7
5.1 Specimen preparation	7
5.2 Defining specimen axes	7
5.3 Stage positioning and calibration	8
5.4 Linear calibration	8
5.5 Preliminary examination	8
5.6 Choice of step size	8
5.7 Determination of the level of angular accuracy needed [7] [8]	10
5.8 Choice of areas to be mapped and map size	10
5.9 Considerations when examining plastically deformed materials	11
6 Analytical procedure	11
6.1 Definition of boundaries	11
6.1.1 Grain boundary angles	11
6.1.2 Handling incomplete boundaries	12
6.1.3 Dealing with special boundaries	12
6.2 Post-acquisition treatment of raw data	12
6.3 Data-cleaning steps	12
6.4 Measurement of sectional grain size	16
6.5 Calculation of average grain size	16
6.6 Representation of data	17
7 Measurement uncertainty	17
8 Reporting of analysis results	18
Annex A (informative) Grain size measurement	20
Annex B (informative) Reproducibility	22
Bibliography	25

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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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.

