BS ISO 16700:2016

BSI Standards Publication

Microbeam analysis — Scanning electron microscopy — Guidelines for calibrating image magnification

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National foreword

This British Standard is the UK implementation of ISO 16700:2016. It supersedes BS ISO 16700:2004 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CII/9, Microbeam analysis.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Microbeam analysis — Scanning electron microscopy — Guidelines for calibrating image magnification

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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 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.

The committee responsible for this document is ISO/TC 202, *Microbeam analysis*, Subcommittee SC 4, *Scanning electron microscopy (SEM)*.

This second edition cancels and replaces the first edition (ISO 16700:2004), which has been technically revised.

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Introduction

The scanning electron microscope is widely used to investigate the surface structure of a range of important materials such as semiconductors, metals, polymers, glass, food and biological materials, and this International Standard is relevant to the need for magnification calibration of the images. It describes the requirements for calibration of the image magnification in the scanning electron microscope using a reference material or a certified reference material.

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INTERNATIONAL STANDARD ISO 16700:2016(E)

Microbeam analysis — Scanning electron microscopy — Guidelines for calibrating image magnification

1 Scope

This International Standard specifies a method for calibrating the magnification of images generated by a scanning electron microscope (SEM) using an appropriate reference material. This method is limited to magnifications determined by the available size range of structures in the calibrating reference material. This International Standard does not apply to the dedicated critical dimension measurement SEM.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

ISO Guide 30, *Reference materials — Selected terms and definitions*

ISO Guide 34, *General requirements for the competence of reference material producers*

ISO Guide 35, *Reference materials — General and statistical principles for certification*

3 Terms and definitions

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

3.1
scanning electron microscope
SEM
instrument that produces magnified images of a specimen by scanning its surface with an electron beam

3.2
image
two-dimensional representation of the specimen surface generated by *SEM* (3.1)

Note 1 to entry: A photograph of a specimen taken using an SEM is a good example of an image.

3.3
image magnification
ratio of the linear dimension of the scan display to the corresponding linear dimension of the specimen scan field

3.4
scale marker
line/generated line (intervals) on the *image* (3.2) representing a designated actual length in the specimen

3.5
reference material
RM
material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process

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