

ICS 37.020

CCS N 32



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 27788-2020

**Microbeam analysis - Scanning electron microscopy -
Guidelines for calibrating image magnification**

Issued on: June 2, 2020

Implemented on: April 1, 2021

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 27788-2011 "Guidelines for Micron Analysis Scanning Electron Microscope Image Magnification Calibration". versus

Compared with GB/T 27788-2011, except for editorial changes, the main technical changes are as follows.

--- Deleted ISO 5725-1;

---The translation of the term "Pitch" is changed from "Line pitch" to "Pitch".

The translation method used in this standard is equivalent to ISO 16700.2016 "Guidelines for Micron Analysis Scanning Electron Microscope Image Magnification Calibration".

The Chinese documents that have a consistent correspondence with the international documents normatively cited in this standard are as follows.

---GB/T 15000.3-2008 Guidelines for working with standard samples (3) General principles and statistical methods for standard sample setting

(ISO Guide35.2006, IDT)

---GB/T 15000.7-2012 Working Guidelines for Standard Samples (7) General requirements for the ability of standard sample producers (ISO Guide34.

2009, IDT)

This standard has made the following editorial changes.

--- Added "A.2.5 China National Institute of Metrology (NIMC)" to informative Appendix A to make this standard more

Operable.

This standard is proposed and managed by the National Microbeam Analysis

Standardization Technical Committee (SAC/TC38).

This standard was drafted by. Institute of Mineral Resources, Chinese Academy of Geological Sciences, Shanghai Institute of Ceramics, Chinese Academy of Sciences, People's Liberation

Military Naval Medical University.

Introduction

Scanning electron microscopy is widely used for the surface structure of many important materials such as semiconductors, metals, polymers, glass, food and biological materials, etc.

Observational research. This standard applies to the calibration of SEM image magnification and describes the use of certified reference materials or parameters in SEM

The test substance is required for image magnification calibration.

Scanning electron microscopy

Guidelines for image magnification calibration

1 Scope

This standard specifies the method for calibrating the magnification of scanning electron microscope (SEM) images using appropriate reference materials.

This standard is applicable to the calibration of the magnification determined by the available range of the distance between the calibration reference materials.

This standard does not apply to special length measuring SEM.

2 Normative references

The following documents are essential for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 27025-2008 General requirements for the ability of testing and calibration laboratories (ISO /IEC 17025.2005, IDT)

ISO Guide 30 Common Terms and Definitions of Standard Samples
(Referencematerials-Selectedtermsanddefinitions)

ISO Guide 34 General requirements for the competence of standard sample producers
(General requirements for the competition of ref-

reference material producers)

ISO Guide 35 General principles and statistical methods for standard sample setting
(Reference materials-General and

statistical principles for certification)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Scanning electron microscope scanning electron microscope

SEM

An instrument that generates a magnified image by scanning the surface of a sample with an electron beam.

3.2

Image image

Two-dimensional characterization of the sample surface produced by the scanning electron microscope (3.1).

Note. A sample photo taken with a scanning electron microscope is one type of image.

3.3

Image magnification

The ratio of the linear scale displayed by the image to the corresponding linear scale of the scanned area on the sample.

3.4

Scale marker

The image (3.2) shows the line segment or interval of the specific actual length on the sample.

3.5

Reference material

RM

One or more substances with sufficiently uniform and stable properties have been confirmed to be suitable for use in the measurement process.