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

GB/T 17722-2026

Replacing GB/T 17722-1999

**Microbeam analysis - Method for the thickness measurement of
gold coating layers by SEM**

微束分析 金覆盖层厚度的扫描电镜测量方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document supersedes GB/T 17722-1999 "Scanning Electron Microscopy Measurement Method for Gold Coating Thickness" and is consistent with GB/T 17722-1999. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The scope has been changed (see Chapter 1, Chapter 1 of the.1999 edition);
- b) Added terms and definitions such as "scale bar, secondary electron image, backscattered electron image, intensity curve, differential processing, and first-order difference curve". (See Chapter 3);
- c) The principles have been removed (see Chapter 4 of the.1999 edition);
- d) A method summary has been added (see Chapter 4);
- e) The requirements for scanning electron microscope parameters have been changed (see Chapter 5, 5.1 of the.1999 edition);
- f) A focused ion beam system was added (see Chapter 5);
- g) The length comparator has been removed (see 5.3 in the.1999 edition);

- h) Added basic requirements for the test specimens (see 6.1);
- i) The sample preparation method was changed (see 6.2, 6.1 in the 1999 edition);

1 Scope

GB/T 17722-2026 is the Chinese national standard covering measuring a gold layer in the electron microscope - the coating on a connector or a bond pad, where a fraction of a micrometre decides both the contact resistance and the cost of the plating. It replaces GB/T 17722-1999, a method twenty-seven years old, and it belongs with the other microbeam standards of this year. It was issued on 28 January 2026 and has been in force since 1 August 2026, replacing GB/T 17722-1999. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a method for measuring the thickness of gold coatings in various gold artifacts using a scanning electron microscope. This document applies to the determination of gold capping layer thicknesses ranging from 25 nm to 50 µm. Measurements of gold capping layers of other thicknesses should follow the same procedure.

Note. The actual measurable minimum thickness is affected by equipment performance parameters such as the image resolution and magnification of the scanning electron microscope, as well as sample preparation techniques and conductivity. Influence.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 27418 Evaluation and Expression of Measurement Uncertainty

GB/T 27788 Guidelines for Magnification Calibration of Scanning Electron Microscope Images Using Microbeam Analysis

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 average thickness The arithmetic mean of a specified number of local thickness measurements is selected at different locations within the basic measurement surface.

3.2 scalemarker The image shows line segments or intervals of a specific actual length on the specimen. [Source: GB/T 27788-2020, 3.4]

3.3 An electron beam scanning image is formed by detecting secondary electrons with energies less than 50 eV using a secondary electron detector. The secondary electron detector detects backscattered... Electron emission is insensitive. [Source: GB/T 21636-2021, 5.4.11]

3.4 Use a dedicated backscattered electron detector (e.g., scintillator, solid-state diode, channel plate, or negatively biased Everhart-Thornley detector). Electron beam scan images detected by the instrument. [Source: GB/T 21636-2021, 5.4.2]

3.5 intensity profile The signal strength is distributed along a selected straight line in the image. [Source: GB/T 43087-2023, 3.1.8]