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

GB/T 18876.1-2024

Replacing GB/T 18876.1-2002

**Standard practice for determining the metallographical constituent and inclusion content
of steels and other metals by automatic image analysis - Part 1: Determining the
inclusion or second-phase constituent content of steels and other metals by automatic
image analysis and stereology**

应用自动图像分析测定钢和其他金属中金相组织、夹杂物含量和级别的标准试验
方法 第1部分：钢和其他金属中夹杂物或第二相组织含量的图像分析与体视学测
定

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. This document is a follow-up to GB/T 18876 "Determination of metallographic structure, inclusion content and grade in steel and other metals by automatic image analysis". Part 1 of "Quasi-Test Method". GB/T 18876 has published the following parts.

1. Image analysis and stereological determination of inclusion or second phase content in steel and other metals;

2. Image analysis and stereological determination of inclusion levels in steel;

3. Image analysis and stereological determination of carbide levels in steel. This document replaces GB/T 18876.1-2002 "Determination of metallographic structure and inclusion content in steel and other metals by automatic image analysis" Standard test methods for inclusion and grade determination in steel and other metals - Part

1. Image analysis and stereological determination of inclusion or second phase content in steel and other metals Compared with GB/T 18876.1-2002, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Added an overview of the method of detecting inclusions using scanning electron microscopy (see Chapter 5);
- b) "interference" has been deleted (see Chapter 7 of the.2002 edition);
- c) Added the requirements of high resolution and high storage capacity of image acquisition system, and the requirement of self-designed interface in software system. See (see Chapter 6);
- d) The sampling requirements for inclusions have been modified (see 7.2, 9.2 of the.2002 edition);
- e) Added sampling requirements for other second phase structures (see 7.3);
- f) Deleted the test specimen (see Chapter 10 of the.2002 edition);
- g) Added the standards for sample preparation requirements (see 8.1,

1 Scope

GB/T 18876.1-2024 is the Chinese national standard on standard practice for determining the metallographical constituent and inclusion content of steels and other metals by automatic image analysis - part 1: determining the inclusion or second-phase constituent content of steels and other metals by automatic image analysis and stereology, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 23 August 2024 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2025. Classification: ICS 77.040.01, CCS H24. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the use of automated image analysis for the stereological determination of the basic morphological features of intrinsic inclusions in steel and other metals. method. This document is applicable to the determination of intrinsic inclusions in steel and also to the determination of discrete second phase structures in any metallic material. Note

1.This method only uses stereological methods and image analysis measurement methods to measure the average internal inclusions or other second phase structures on the polished surface of the longitudinal specimen. If inclusions or other second phase structures are twisted or otherwise oriented due to deformation, the information obtained from the plane cannot provide three-dimensional information. Such information research

requires measurements on three mutually perpendicular planes and is not within the scope of this test method. Note

2. Second phase structure in this document refers to the component different from the matrix. Discrete phase refers to the phase in which fine particles are distributed in a dispersed form in the metal.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 10561 Determination of non-metallic inclusions in steel - Grading chart microscopic examination method

GB/T 13298 Metal microstructure inspection methods

GB/T 18876.2 Standard test for determination of metallographic structure, inclusion content and grade in steel and other metals using automated image analysis Methods Part

3 Terms and definitions

The terms and definitions defined in GB/T 10561 and GB/T 30067 and the following apply to this document.

3.1 Stereological method A method to infer or describe three-dimensional microstructural features by measuring two-dimensional cross-sections.

3.2 Gray level The color range of the non-color between black and white displayed on the terminal screen is an important parameter of the detected feature. It is not only a reflection of its own characteristics, but is also affected by factors such as light source, optical path and image acquisition.

3.3 Threshold setting thresholdsetting The range of the grayscale value displayed by a tissue in the microscope field is set to convert the original gray image or color image