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Replacing GB/T 21638-2008

Microbeam analysis - Guidelines for electron beam microanalysis of defects in steel materials

微束分析 钢铁材料缺陷电子束显微分析方法通则

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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 is required.

This document replaces GB/T 21638-2008 "General rules for electron beam microscopic analysis of defects in steel materials" and is consistent with GB/T 21638-2008 Compared with the previous version, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

a) The definition of macro analysis has been changed (see 3.2, 3.2 of the 2008 edition);

b) Deleted 3.3 Microscopic analysis in the terminology (see 3.3 of the 2008 edition);

c) The definition of electron beam microanalysis has been changed (see 3.3, 3.4 of the 2008 edition);

d) 5.2 Preparation before testing was deleted (see 5.2 of the 2008 edition);

e) Added sample preparation (see 5.2);

f) 5.5 Material quality inspection has been deleted (see 5.5 of the 2008 edition);

g) Appendix A has been deleted (see Appendix A of the 2008 edition).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed and coordinated by the National Microbeam Analysis Standardization Technical Committee (SAC/TC38).

This document was drafted by: Shanghai Power Equipment Complete Design Institute Co., Ltd., Baoshan Iron & Steel Co., Ltd., China Science Institute of Chemistry, Shanghai University, and National Standard (Beijing) Inspection and Certification Co., Ltd.

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This document was first published in 2008 and this is the first revision.

Introduction

The defects of steel materials mainly include surface defects and internal defects. Surface defects such as scarring and peeling may affect the material.

Internal defects such as cracks, center porosity, shrinkage, excessive inclusions, etc., these defects may seriously affect the mechanical properties of the material performance and durability.

The formation of defects in steel materials involves many aspects, including material selection, quality control of smelting and casting processes, and subsequent processing.

By analyzing the causes of defects, improving production processes, optimizing material selection and use conditions, it is possible to effectively reduce or avoid The occurrence of these defects, thereby improving the quality and performance of steel materials.

Electron beam microanalysis is an analytical technique in the field of high technology and is widely used in the field of materials.

Microanalysis method is based on electron beam microanalysis technology, which integrates microanalysis with material quality inspection, scientific research, production process and user use.

Combined with other technologies, comprehensive analysis is carried out to characterize the causes of defects in steel materials.

Microbeam analysis of steel material defects Electron beam microscopy General principles of analytical methods

1 Scope

This document specifies the instruments and equipment, analysis methods and procedures, and analysis reports for analyzing defects in steel materials using electron beam microscopy technology.

This document applies to electron beam microscopic analysis of internal and surface defects in steel materials.

2 Normative references

GB/T 4340.1

GB/T 10561

GB/T 13299

GB/T 15074

GB/T 17359

GB/T 19501

GB/T 30703

GB/T 34172

GB/T 34474.1

GB/T 38532

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Defect

Abnormal parts such as discontinuity and incompleteness on the surface and/or inside of steel materials that affect the performance of the material.

Note. Usually formed during smelting, processing, storage, transportation and/or use.

3.2 Macroscopic analysis

Analysis of defects by the naked eye or through a magnifying glass.

3.3

The microscopic morphology, crystal structure and chemical composition of defects are analyzed using electron beam analysis equipment.