



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

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**Non-destructive testing of welds - Ultrasonic testing - Testing of
welds in austenitic steels and nickel-based alloys**

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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 of Standardization Documents"

Drafting.

This document uses the translation method to be equivalent to ISO 22825.2017

“Non-destructive testing of welds, ultrasonic testing of austenitic steel and nickel-based alloy welding

Seam Detection?

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

---GB/T 12604.1-2020 Non-destructive testing term Ultrasonic testing (ISO 5577.2017, MOD);

---GB/T 19799.2-2012 Non-destructive testing Ultrasonic testing No. 2 calibration test block (ISO 7963.2006, IDT);

---GB/T 9445-2015 Non-destructive testing personnel qualification and certification (ISO 9712:2012, IDT);

---GB/T 34628-2017 General Rules for the Application of Metallic Materials for Non-destructive Testing of Welds (ISO 17635:2016, IDT).

This document has also made the following editorial changes.

---EN12668-1, EN12668-2 and EN12668-3 were changed to ISO 22232-1, ISO 22232-2 and ISO 22232-3;

---Add a note to facilitate the understanding of "probe contact surface width" (see 8.1).

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Introduction

The ultrasonic inspection of austenitic steel components and dissimilar steel welds is usually difficult, which is mainly due to its structure, grain size, and different materials.

The material properties are related to the mechanical and acoustic properties of anisotropy. These characteristics are distinct from the isotropic characteristics of low-alloy steel welds.

Compared.

Austenitic welds and other coarse-grained anisotropic materials significantly affect ultrasonic propagation. In addition, fusion lines and/or columnar crystals may produce

Acoustic beam distortion, abnormal reflection and wave form conversion. Therefore, it is difficult for ultrasonic to penetrate the weld metal, and sometimes it cannot penetrate the weld metal.

This type of metal ultrasonic detection technology is different from conventional ultrasonic detection technology. This type of detection technology usually does not use conventional shear wave oblique probes, and

Use oblique incident longitudinal wave dual crystal probe or creeping wave probe.

In addition, it is necessary to make a typical reference test block with welds so as to study the inspection process and set the initial

Start sensitivity level, evaluate and confirm the effectiveness of the testing process. Refer to the characteristics of the material, groove, welding process, size and surface condition of the test block

The point is consistent with the inspected part.

Ultrasonic testing for non-destructive testing of welds

Austenitic steel and nickel-based alloy weld inspection

1 Scope

This document specifies the principles to be followed when formulating the following procedures for ultrasonic testing of test objects.

---Stainless steel welds;

---Nickel-based alloy welds;

---Dual-phase steel welds;

---Dissimilar metal welds;

---Austenitic steel welds.

The purpose of the test may vary, for example.

---Quality grade evaluation in manufacturing.

---Detection of specific discontinuities in service.

This document does not contain the acceptance level, but the acceptance level can be determined according to the detection range (see 4.1).

This document is suitable for manual inspection and automatic inspection.

2 Normative references

The contents of the following documents constitute the indispensable clauses of the text through the normative references in the text. Among them, dated reference documents,

Only the version corresponding to that date is applicable to this document; for undated

references, the latest version (including all amendments) is applicable to this document.
document.

ISO 5577 Non-destructive testing Ultrasonic testing terminology (Non-destructive testing-Ultrasonic testing-Vocabulary)

ISO 7963 Non-destructive testing Ultrasonic testing No. 2 calibration test block (Non-destructive testing-Ultrasonic testing-Specification for calibration block No. 2)

ISO 9712 Non-destructive testing personnel qualification and certification (Non-destructive testing-Qualification and certification of NDT personnel)

ISO 13588 Non-destructive testing, ultrasonic testing, application of automatic phased array ultrasonic technology (Non-destructive testing of welds-Ultrasonic testing-Use of automated phased array technology)

ISO 17635 Non-destructive testing of welds-General rules for the application of metallic materials (Non-destructive testing of welds-General rules for metallic materials)

ISO 22232-1 Non-destructive testing ultrasonic equipment performance characteristics and test methods Part 1. Instruments (Non-destructive testing-Characterization and verification of ultrasonic testing equipment-Part 1. Instruments)

ISO 22232-2 Non-destructive testing ultrasonic equipment performance characteristics and test methods Part 2. Probes (Non-destructive testing-Characterization and verification of ultrasonic testing equipment-Part 2. Probes)

ISO 22232-3 Non-destructive testing ultrasonic equipment performance characteristics and test methods Part 3. Combined performance (Non-destructive testing-Characterization and verification of ultrasonic testing equipment-Part 3. Combined equipment)