



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

GB/T 23902-2021

**Non-destructive testing - Ultrasonic testing - Time-of-flight
diffraction technique as a method for detection and sizing of
discontinuities**

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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 replaces GB/T 23902-2009 "Non-destructive Testing Ultrasonic Testing Ultrasonic Diffraction Acoustic Time Technical Testing and Evaluation Methods"

Compared with GB/T 23902-2009, the main technical changes are as follows.

a) Some terms and definitions, symbols, and abbreviations have been added (see Appendix NA);

b) Deleted part of the content (see Appendix NB);

c) Some parameter requirements have been changed (see Appendix NC).

The translation method used in this document is equivalent to ISO 16828.2012

"Non-destructive testing, ultrasonic testing, ultrasonic diffraction, acoustic time technical testing and evaluation.

Price Method."

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

---GB/T 9445-2015 qualification and certification of non-destructive testing personnel (ISO 9712.2012, IDT);

---GB/T 39240-2020 General Principles of Ultrasonic Testing for Nondestructive Testing (ISO 16810.2012, MOD);

---GB/T 39242-2020 Ultrasonic testing sensitivity and range setting for non-destructive testing (ISO 16811.2012, MOD).

This document has made the following editorial changes.

---Added an informative appendix NA. Compared with GB/T 23902-2009, this document adds new terms, definitions, symbols, and abbreviations;

---Informative appendix NB is added, and the contents of this document are deleted compared with GB/T 23902-2009;

---Added informative appendix NC, the content of this document compared with GB/T 23902-2009.

This document was proposed and managed by the National Standardization Technical Committee for Nondestructive Testing (SAC/TC56).

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Institute of Metrology.

1 Scope

This document specifies the general principles of the Ultrasonic Time-of-Sound Diffraction (TOFD) method. This document is applicable to low alloy and carbon steel components

Discontinuous detection. This document is also applicable to other types of materials, provided that the number of components must be fully considered when using ultrasonic diffraction acoustic technology.

What shape and material acoustic properties and detection sensitivity.

This document is generally applicable to discontinuous testing in materials included in ISO 16810, including welds, which can be used as a reference. select

The reason for this method is its clear ultrasound probe position and scanning direction.

Unless otherwise specified in the cited documents, this document applies to the minimum requirements.

Unless expressly stated otherwise, this document applies to the following levels specified by ISO 16811.

---1 category, no restrictions;

- Category 2 and Category 3, the specified restrictions apply.

Note 1. Chapter 9 has similar instructions.

For category 4 and category 5, product testing requires special process procedures.

Note 2. Chapter 9 has similar instructions.

Note 3. ISO 10863 describes the use of TOFD for weld inspection technology.

Note 4. The relevant acceptance documents are given in ISO 15626.

2 Normative references

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

Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

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

ISO 16810 Non-destructive testing- Ultrasonic testing- General principles)

ISO 16811 non-destructive testing ultrasonic testing sensitivity and range setting
(Non-destructive testing-Ultrasonic

testing-Sensitivityandrangesetting)

EN12668-1 Non-destructive testing Ultrasonic testing equipment performance and
inspection Part 1.Instruments (Non-destructive testing-

Characterizationandverificationofultrasonicexaminationequipment-Part 1.Instruments)

EN12668-2 Non-destructive testing Ultrasonic testing equipment performance and
inspection Part 2.Probe (Non-destructive testing-

Characterizationandverificationofultrasonicexaminationequipment-Part 2.Probes)

EN12668-3 Non-destructive testing. Performance and inspection of ultrasonic testing
equipment. Part 3.Combined equipment (Non-destructive

testing-Characterizationandverificationofultrasonicexaminationequipment-Part 3.Combined
equipment)