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Non-destructive testing - Ultrasonic testing - Time-of-flight diffraction technique for detection and sizing of discontinuities (ISO 16828:2025)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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EN ISO 16828

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English Version

**Non-destructive testing - Ultrasonic testing - Time-of-flight
diffraction technique for detection and sizing of
discontinuities (ISO 16828:2025)**

Essais non destructifs - Contrôle par ultrasons -
Technique de diffraction du temps de vol pour la
détection et le dimensionnement des discontinuités
(ISO 16828:2025)

Zerstörungsfreie Prüfung - Ultraschallprüfung -
Beugungslaufzeittechnik zum Auffinden und
Ausmessen von Inhomogenitäten (ISO 16828:2025)

This European Standard was approved by CEN on 11 July 2025.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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EN ISO 16828:2025 (E)

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European foreword

This document (EN ISO 16828:2025) has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing " in collaboration with Technical Committee CEN/TC 138 "Non-destructive testing" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2026, and conflicting national standards shall be withdrawn at the latest by January 2026.

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Endorsement notice

The text of ISO 16828:2025 has been approved by CEN as EN ISO 16828:2025 without any modification.



International Standard

ISO 16828

Non-destructive testing — Ultrasonic testing — Time-of-flight diffraction technique for detection and sizing of discontinuities

*Essais non destructifs — Contrôle par ultrasons — Technique
de diffraction du temps de vol pour la détection et le
dimensionnement des discontinuités*

**Second edition
2025-07**

ISO 16828:2025(en)



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ISO 16828:2025(en)**Foreword**

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 3, *Ultrasonic testing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 16828:2012), which has been technically revised.

The main changes are as follows:

- title revised by removing “as a method”;
- clarifications of abbreviations and symbols;
- figures have been updated;
- formulae have been corrected;
- term “dead zone” replaced by “obscured zone”.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO 16828:2025(en)**Introduction**

The following standards on ultrasonic testing developed by ISO/TC 135 are related.

ISO 16810, *Non-destructive testing — Ultrasonic testing — General principles*

ISO 16811, *Non-destructive testing — Ultrasonic testing — Sensitivity and range setting*

ISO 16823, *Non-destructive testing — Ultrasonic testing — Through-transmission technique*

ISO 16826, *Non-destructive testing — Ultrasonic testing — Testing for discontinuities perpendicular to the surface*

ISO 16827, *Non-destructive testing — Ultrasonic testing — Characterization and sizing of discontinuities*

Non-destructive testing — Ultrasonic testing — Time-of-flight diffraction technique for detection and sizing of discontinuities

1 Scope

This document specifies the general principles for the application of the time-of-flight diffraction (TOFD) technique for both detection and sizing of discontinuities in low-alloyed carbon steel components.

This document also applies to other types of materials, provided the application of the TOFD technique is performed with necessary consideration of geometry, acoustical properties of the materials, and the test sensitivity.

Although this document is applicable, in general terms, for discontinuities in materials and applications covered by ISO 16810, it contains references to the application on welds. This approach has been chosen for reasons of clarity as to the probe positions and directions of scanning.

Unless otherwise specified in the referencing documents, the minimum requirements specified in this document apply.

Unless explicitly stated otherwise, this document is applicable to the following categories of test objects as specified in ISO 16811:

- category 1, without restrictions;
- categories 2 and 3, specified restrictions apply (see [Clause 10](#));
- categories 4 and 5 require special procedures, which are also addressed (see [Clause 10](#)).

NOTE Techniques for the use of TOFD for weld testing are described in ISO 10863 and the related acceptance criteria are given in ISO 15626.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5577, *Non-destructive testing — Ultrasonic testing — Vocabulary*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 16810, *Non-destructive testing — Ultrasonic testing — General principles*

ISO 22232-1, *Non-destructive testing — Characterization and verification of ultrasonic test equipment — Part 1: Instruments*

ISO 22232-2, *Non-destructive testing — Characterization and verification of ultrasonic test equipment — Part 2: Probes*

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