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

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Contents

Page

Foreword ..... **v**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Symbols and units **2**
5 General **3**
5.1 Principle of the technique 3
5.2 Requirements for surface condition and couplant 5
5.3 Materials and process type 5
6 Qualification of test personnel **5**
7 Requirements for test equipment **6**
7.1 General 6
7.2 Instrument and display 6
7.3 Probes 8
7.4 Scanning 8
8 TOFD setup procedures **9**
8.1 General 9
8.2 Probe selection and probe separation 9
8.2.1 Probe selection 9
8.2.2 Probe separation 10
8.3 Time window setting 10
8.4 Sensitivity setting 10
8.5 Scan increment setting 10
8.6 Setting of scanning speed 11
8.7 Checking of system performance 11
9 Interpretation and analysis of data **11**
9.1 Basic analysis of discontinuities 11
9.1.1 General 11
9.1.2 Characterization of discontinuities 12
9.1.3 Estimation of discontinuity position 12
9.1.4 Estimation of discontinuity length 13
9.1.5 Estimation of discontinuity depth and height 13
9.2 Detailed analysis of discontinuities 14
9.2.1 General 14
9.2.2 Additional scans 14
9.2.3 Additional algorithms 15
10 Detection and sizing in complex geometries **16**
11 Limitations of the TOFD technique **16**
11.1 General 16
11.2 Accuracy and resolution 17
11.2.1 General 17
11.2.2 Inaccuracy in the lateral position 17
11.2.3 Timing inaccuracy 17
11.2.4 Inaccuracy in sound velocity 17
11.2.5 Inaccuracy in probe centre separation 17
11.2.6 Spatial resolution 18
11.3 Obscured zones 18
12 TOFD testing without data recording **19**

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13 Test procedure **19**
14 Test report **19**
Annex A (informative) **Reference blocks** **20**
Bibliography **21**

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Foreword

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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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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".

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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*

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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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5577 and the following apply.

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