International Standard

ISO 16831

Non-destructive testing — Ultrasonic testing — Characterization and verification of ultrasonic equipment for the determination of thickness

Essais non destructifs — Contrôle par ultrasons — Caractérisation et vérification des appareils de contrôle par ultrasons pour la détermination de l'épaisseur

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Contents

Page

Foreword ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 General requirements **1**

5 Manufacturer's technical specification for ultrasonic equipment for thickness determination **2**
5.1 General 2
5.2 General attributes 2
5.3 Display 2
5.4 Transmitter 3
5.5 Receiver 3
5.6 Other information 3

6 Blocks **3**
6.1 General 3
6.2 Material 4
6.3 Shape and size 4
6.3.1 Accuracy blocks 4
6.3.2 Resolution block 5

7 Performance requirements for ultrasonic equipment for thickness determination **5**

8 Probes **6**

9 Group 1 tests **7**
9.1 Equipment required for Group 1 tests 7
9.2 Stability against temperature of the instrument 7
9.2.1 Procedure 7
9.2.2 Acceptance criterion 7
9.3 Low-battery warning 7
9.3.1 Procedure 7
9.3.2 Acceptance criteria 8
9.4 Battery operational time 8
9.4.1 Procedure 8
9.4.2 Acceptance criteria 8
9.5 Stability against voltage variation 8
9.5.1 Procedure 8
9.5.2 Acceptance criterion 9
9.6 Operational current range 9
9.6.1 Procedure 9
9.6.2 Acceptance criterion 9
9.7 Extended operational temperature range of the probe 9
9.7.1 General 9
9.7.2 Procedure 9
9.7.3 Acceptance criteria 9
9.8 Pulse repetition frequency 10
9.8.1 Procedure 10
9.8.2 Acceptance criterion 10
9.9 Transmitter voltage, pulse rise time and duration 10
9.9.1 Procedure 10
9.9.2 Acceptance criteria 12
9.10 Gain control of the receiver 12
9.10.1 General 12
9.10.2 Procedure 12
9.10.3 Acceptance criteria 12

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9.11 Frequency response of the receiver 12
9.11.1 General 12
9.11.2 Procedure 12
9.11.3 Acceptance criteria 13
9.12 Setup of the instrument 13
9.12.1 General 13
9.12.2 Procedure 13
9.13 Determination performance and resolution 13
9.13.1 Procedure 13
9.13.2 Acceptance criteria 14
9.14 Display response time 14
9.14.1 Procedure 14
9.14.2 Acceptance criterion 14
10 Group 2 tests 14
10.1 Equipment required for Group 2 tests 14
10.2 General characteristics 14
10.3 General mechanical state and external aspects 14
11 Group 3 tests 15
11.1 General 15
11.2 General mechanical state and external aspects 15
11.3 Performance 15
11.3.1 Procedure 15
11.3.2 Acceptance criterion 15
Bibliography 16

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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 16831:2012), which has been technically revised.

The main changes are as follows:

— terminology has been revised from "measurement" to "determination"; as only the time of flight of the ultrasonic signal can be measured in relation to traceable references, the thickness and sound velocity can only be determined;

— tests have been adapted to the boundary conditions of digital instruments;

— procedures for Group 2 and Group 3 tests have been simplified;

— Clauses for characterisation of the receiver have been added.

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Non-destructive testing — Ultrasonic testing — Characterization and verification of ultrasonic equipment for the determination of thickness

1 Scope

This document specifies test methods and acceptance criteria, within the frequency range of 0,5 MHz to 15 MHz, for assessing the performance of equipment dedicated for determining thickness using pulse-echo ultrasound, e.g. according to ISO 16809.

This document only specifies the verifications required for the determination of thickness.

This document is applicable to instruments with numerical display and instruments with A-scan presentation, each using either single- or dual-transducer probes.

The tests described in this document can be used for verifying equipment covered by ISO 22232-1 and ISO 22232-2 when used for thickness determination.

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

EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 General requirements

Equipment for the determination of thickness using ultrasound is in accordance with this document if it fulfils all the following requirements:

a) the equipment shall be in accordance with Clauses 8, 9, 10 and 11;

b) a statement of conformity shall be available;

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