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NSAI Standards

Irish Standard
I.S. EN ISO 2400:2012

Non-destructive testing - Ultrasonic testing - Specification for calibration block No. 1 (ISO 2400:2012)

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This document replaces:
EN 12223:1999

This document is based on:	*Published:*
EN ISO 2400:2012	3 October, 2012
EN 12223:1999	8 December, 1999

This document was published under the authority of the NSAI and comes into effect on:
3 October, 2012

ICS number:
25.160.40

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 2400

September 2012

ICS 25.160.40

Supersedes EN 12223:1999

English Version

Non-destructive testing - Ultrasonic testing - Specification for calibration block No. 1 (ISO 2400:2012)

Essais non destructifs - Contrôle par ultrasons - Spécifications relatives au bloc d'étalonnage n° 1 (ISO 2400:2012)

Zerstörungsfreie Prüfung - Ultraschallprüfung - Beschreibung des Kalibrierkörpers Nr 1 (ISO 2400:2012)

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Foreword

This document (EN ISO 2400:2012) has been prepared by Technical Committee CEN/TC 138 “Non-destructive testing”, the secretariat of which is held by AFNOR, in collaboration with Technical Committee ISO/TC 135 "Non-destructive testing".

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of an identical text or by endorsement, at the latest by mars 2013, and conflicting national standards shall be withdrawn at the latest by mars 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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INTERNATIONAL STANDARD

ISO 2400

Second edition
2012-09-15

Non-destructive testing — Ultrasonic testing — Specification for calibration block No. 1

Essais non destructifs — Contrôle par ultrasons — Spécifications relatives au bloc d'étalonnage nº 1

Reference number
ISO 2400:2012(E)

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 2400 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing*, in collaboration with Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 3, *Ultrasonic 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 2400:1972), which has been technically revised.

Changes from the first edition include the addition of:

— a new clause on manufacture of the block;

— a new clause on sound velocities;

— a new clause on marking and certification of the blocks;

— a new clause on possible modifications to block No. 1;

— a new clause on the use of existing blocks;

— a normative annex on the determination of velocities.

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Non-destructive testing — Ultrasonic testing — Specification for calibration block No. 1

1 Scope

This International Standard specifies requirements for the dimensions, material and manufacture of a steel block for calibrating ultrasonic test equipment used in manual testing.

2 Normative references

The following referenced documents are indispensable for the application 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 inspection — Vocabulary*

EN 1330-4, *Non-destructive testing — Terminology — Part 4: Terms used in ultrasonic testing*

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 and EN 1330-4 apply.

4 Manufacture

4.1 Steel

Blocks shall be manufactured from steel grade S355J0, specified in EN 10025-2, or from steel of an equivalent grade.

4.2 Dimensions

The dimensions of calibration block No. 1 shall be as shown in Figure 1.

NOTE This International Standard does not include any requirement for a plastic insert.

4.3 Machining, heat treatment and surface finish

Blocks shall be rough-machined to a dimension of 320 mm × 120 mm × 30 mm before heat treatment which shall consist of:

— austenitizing at 920 °C for 30 min;

— rapid cooling (quenching) in water;

— tempering by heating to 650 °C for 3 h;

— cooling in still air.

All external surfaces shall be machined to an Ra value not greater than 0,8 µm.

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Prior to final machining, the block shall be proven to be free from internal discontinuities. For this purpose, an ultrasonic examination shall be carried out after the heat treatment, with a longitudinal wave probe of at least 10 MHz nominal centre frequency and having a transducer size of 10 mm to 15 mm. The block shall be checked on the basis of all four long faces to cover the complete volume. With the probe positioned on the largest face of the block, the equipment gain shall be set to achieve a grain scatter noise of 10 % of the screen height. No echo shall have an amplitude greater than that of the grain scatter noise.

4.4 Reference marks

Reference marks shall be permanently marked as shown in Figure 1 and Table 1.

5 Velocities

The velocities of longitudinal and transverse waves shall be determined as specified in Annex A. The velocities shall be determined within a maximum permissible error of ±0,2 %, i.e. with an uncertainty of ±6 m/s for transverse waves and ±12 m/s for longitudinal waves.

The determined longitudinal wave velocity, v_l, shall be 5 920 m/s ± 30 m/s and the transverse wave velocity, v_t, shall be 3 255 m/s ± 15 m/s.

6 Marking

The block shall be permanently marked, in the area shown in Figure 1, with:

a) the number of this International Standard, i.e. ISO 2400;

b) the manufacturer's serial number and trade mark.

7 Declaration of conformity

A declaration shall be issued by the manufacturer for each block, containing:

a) a statement that the block complies with this International Standard, i.e. ISO 2400;

b) the mean value of the determined longitudinal wave velocities, v_l; see Clause 5;

c) the mean value of the determined transverse wave velocities, v_t; see Clause 5.

8 Possible modifications to block No. 1

8.1 General

One of the modifications in 8.2 or 8.3 shall be made to the block.

8.2 Slots at zero point

If this modification is chosen, two slots at the zero point shall be machined (see Figure 2), which for angle beam probes provide calibrating signals at intervals of 100 mm.

8.3 Circular reflector

If this modification is chosen, a circular arc reflector accessible from the longer sides of the block shall be machined, see Figure 3. For angle beam probes, this provides calibrating signals at beam path lengths of 25 mm, 225 mm, 350 mm, etc.

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8.4 Block thickness

Thicker blocks are permitted.

9 Existing blocks

Existing blocks fulfil the requirements of this International Standard provided that they meet the requirements on velocities (see Clause 5) and dimensions (see 4.2) with the exception that the small side-drilled hole may have a diameter of 1,5 mm.

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