SLOVENSKI STANDARD
SIST EN ISO 22232-2:2020

01-december-2020

Nadomešča:
SIST EN 12668-2:2011

Neporušitvene preiskave - Ugotavljanje značilnosti in overjanje naprav za ultrazvočno preskušanje - 2. del: Preskuševalne glave (ISO 22232-2:2020)

Non-destructive testing - Characterization and verification of ultrasonic test equipment - Part 2: Probes (ISO 22232-2:2020)

Zerstörungsfreie Prüfung - Charakterisierung und Verifizierung der Ultraschall-Prüfausrüstung - Teil 2: Prüfköpfe (ISO 22232-2:2020)

Essais non destructifs - Caractérisation et vérification de l'appareillage de contrôle par ultrasons - Partie 2: Traducteurs (ISO 22232-2:2020)

Ta slovenski standard je istoveten z: **EN ISO 22232-2:2020**

ICS:

19.100	Neporušitveno preskušanje	Non-destructive testing

SIST EN ISO 22232-2:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 22232-2

September 2020

ICS 19.100

Supersedes EN 12668-2:2010

English Version

Non-destructive testing - Characterization and verification of ultrasonic test equipment - Part 2: Probes (ISO 22232-2:2020)

Essais non destructifs - Caractérisation et vérification de l'appareillage de contrôle par ultrasons - Partie 2: Traducteurs (ISO 22232-2:2020)

Zerstörungsfreie Prüfung - Charakterisierung und Verifizierung der Ultraschall-Prüfausrüstung - Teil 2: Prüfköpfe (ISO 22232-2:2020)

This European Standard was approved by CEN on 21 September 2020.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 22232-2:2020 E

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European foreword

This document (EN ISO 22232-2:2020) 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of an identical text or by endorsement, at the latest by March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.

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

This document supersedes EN 12668-2:2010.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 22232-2:2020 has been approved by CEN as EN ISO 22232-2:2020 without any modification.

INTERNATIONAL STANDARD

ISO 22232-2

First edition
2020-09

Non-destructive testing — Characterization and verification of ultrasonic test equipment —

Part 2: Probes

Essais non destructifs — Caractérisation et vérification de l'appareillage de contrôle par ultrasons —
Partie 2: Traducteurs

Reference number
ISO 22232-2:2020(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.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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).

A list of all parts in the ISO 22232 series can be found on the ISO website.

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.

Non-destructive testing — Characterization and verification of ultrasonic test equipment —

Part 2: Probes

1 Scope

This document specifies the characteristics of probes used for non-destructive ultrasonic testing in the following categories with centre frequencies in the range of 0,5 MHz to 15 MHz, focusing or without focusing means:

a) single- or dual-transducer contact probes generating longitudinal and/or transverse waves;

b) single-transducer immersion probes.

Where material-dependent ultrasonic values are specified in this document they are based on steels having a sound velocity of (5 920 ± 50) m/s for longitudinal waves, and (3 255 ± 30) m/s for transverse waves.

This document excludes periodic tests for probes. Routine tests for the verification of probes using on-site procedures are given in ISO 22232-3.

If parameters in addition to those specified in ISO 22232-3 are to be verified during the probe's life time, as agreed upon by the contracting parties, the procedures of verification for these additional parameters can be selected from those given in this document.

This document also excludes ultrasonic phased array probes, therefore see ISO 18563-2.

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 7963, *Non-destructive testing — Ultrasonic testing — Specification for calibration block No. 2*

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

ISO/IEC 17050-1, *Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements*

3 Terms and definitions

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

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

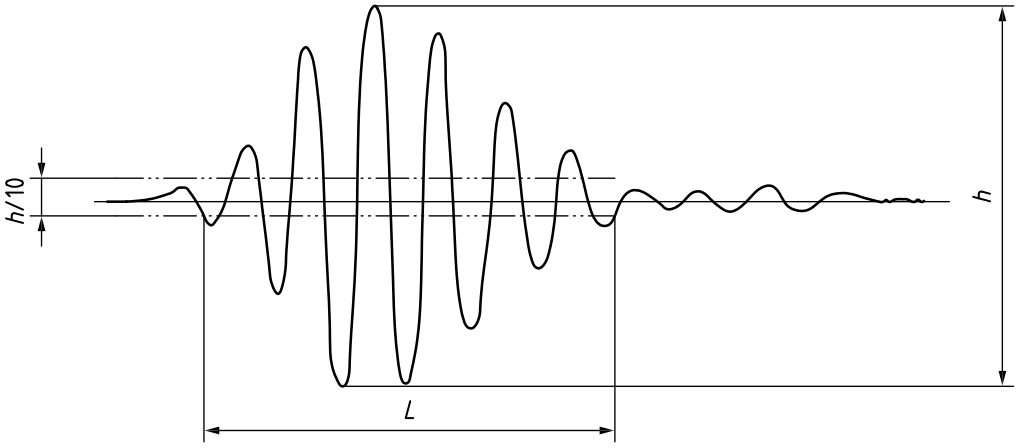
— ISO Online browsing platform: available at https://www.iso.org/obp

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

3.1
horizontal plane
<angle-beam probes> plane perpendicular to the *vertical plane* (3.7) of the sound beam including the beam axis in the material

3.2
peak-to-peak amplitude
difference between the highest positive and the lowest negative amplitude in a pulse

Note 1 to entry: See Figure 1.



Key

h peak-to-peak amplitude
L pulse duration

Figure 1 — Typical ultrasonic pulse

3.3
probe data sheet
document giving manufacturer's technical specifications of the same type of probes, i.e. probes manufactured in series

Note 1 to entry: The data sheet does not necessarily need to be a test certificate of performance.

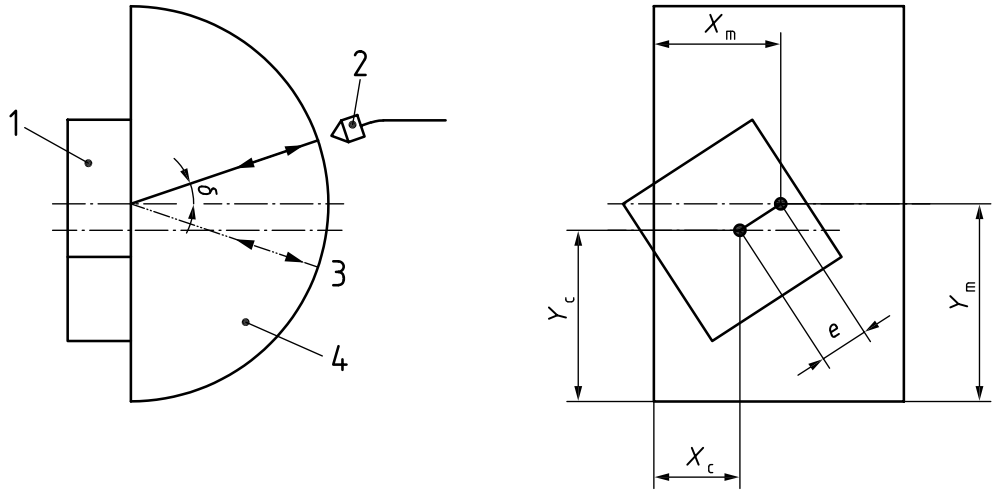
Note 2 to entry: For individually designed or manufactured probes, some parameters may not be accurately known before manufacturing.

3.4
probe test report
document showing compliance with this document giving the measured values of the required parameters of one specific probe, including test equipment and conditions

3.5
reference side
right side of an angle-beam probe looking in the direction of the beam, unless otherwise specified by the manufacturer

3.6
squint angle for straight-beam probes
deviation between the beam axis and the line perpendicular to the coupling surface at the point of incidence

Note 1 to entry: See Figure 2.



Key

1	ultrasonic straight-beam probe	e	offset
2	EMA receiver	δ	squint angle for straight-beam probes
3	echo point	X_c, Y_c	coordinates of the centre of the probe
4	hemicylindrical test block	X_m	coordinate of EMA receiver
		Y_m	coordinate of the centre of the block

Figure 2 — Squint angle and offset for a straight-beam probe

3.7
vertical plane
<angle-beam probes> plane through the beam axis of a sound beam in the probe wedge and the beam axis in the test object

3.8
wear allowance
maximum wear of the probe contact surface which does not affect the performance of the probe

Note 1 to entry: Wear allowance is typically expressed in millimetres.

4 Symbols

Symbol	Unit	Meaning
L	us	Pulse duration
h	V	Peak-to-peak amplitude
f_o	Hz	Centre frequency
f_u	Hz	Upper cut-off frequency
f_l	Hz	Lower cut-off frequency
Δf	Hz	Bandwidth
Δf_{rel}	%	Relative bandwidth
S	dB	Pulse-echo sensitivity
N_0	mm	Near field length
F_D	mm	Focal distance
F_L	mm	Length of focal zone at −6 dB using a reflector or −3 dB using a hydrophone
Z_P	mm	Focal point
W_x	mm	Focal width on X-axis