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Non-destructive testing - Characterization and verification of ultrasonic examination equipment - Part 1: Instruments

I.S. EN 12668-1:2010

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English Version

Non-destructive testing - Characterization and verification of ultrasonic examination equipment - Part 1: Instruments

Essais non destructifs - Caractérisation et vérification de l'appareillage de contrôle par ultrasons - Partie 1 : Appareils

Zerstörungsfreie Prüfung - Charakterisierung und Verifizierung der Ultraschall-Prüfausrüstung - Teil 1: Prüfgeräte

This European Standard was approved by CEN on 25 December 2009.

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Foreword

This document (EN 12668-1:2010) has been prepared by 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of an identical text or by endorsement, at the latest by August 2010, and conflicting national standards shall be withdrawn at the latest by August 2010.

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.

This document supersedes EN 12668-1:2000.

EN 12668, *Non-destructive testing — Characterization and verification of ultrasonic examination equipment*, consists of the following parts:

- *Part 1: Instruments*
- *Part 2: Probes*
- *Part 3: Combined equipment*

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1 Scope

This European Standard specifies methods and acceptance criteria for assessing the electrical performance of analogue and digital ultrasonic instruments for pulse operation using A-scan display, employed for manual ultrasonic non-destructive examination with single or dual-element probes operating within the centre frequency range 0,5 MHz to 15 MHz. Ultrasonic instruments for continuous waves are not included in this standard. This standard may partly be applicable to ultrasonic instruments in automated systems but then other tests can be needed to ensure satisfactory performance.

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.

EN 1330-4:2010, *Non-destructive testing — Terminology — Part 4: Terms used in ultrasonic testing*

EN 12668-3, *Non-destructive testing — Characterization and verification of ultrasonic examination equipment — Part 3: Combined equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1330-4:2010 and the following apply.

3.1

amplifier frequency response

variation of the gain of an amplifier versus frequency

NOTE It is usually specified by a plot of gain (normalized to the peak gain value) versus frequency.

3.2

amplifier bandwidth

width of the frequency spectrum between the high and low cut-off frequencies

NOTE This standard uses as limits the points at which the gain is 3 dB below the peak value.

3.3

cross-talk during transmission

amount of energy transfer from the transmitter output to the receiver input during the transmission pulse, with the ultrasonic instrument set for dual-element probe (separate transmitter and receiver)

3.4

calibrated dB-switch

device controlling the overall gain of the ultrasonic instrument calibrated in decibels

3.5

dead time after transmitter pulse

time interval following the start of the transmitter pulse during which the amplifier is unable to respond to incoming signals, when using the pulse echo method, because of saturation by the transmitter pulse

3.6

digitisation sampling error

error introduced into the displayed amplitude of an input signal by the periodic nature of measurements taken by an analogue-to-digital converter

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