

Non-destructive testing - Ultrasonic thickness measurement

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Non-destructive testing - Ultrasonic thickness measurement

Essais non destructifs - Mesurage de l'épaisseur par
ultrasons

Zerstörungsfreie Prüfung - Dickenmessung mit Ultraschall

This European Standard was approved by CEN on 25 December 2010.

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Foreword

This document (EN 14127:2011) 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of an identical text or by endorsement, at the latest by August 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

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 14127:2004, which has been editorially revised, in order to take into account the new edition of EN 1330-4:2010.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the principles for ultrasonic thickness measurement of metallic and non-metallic materials by direct contact, based on measurement of time-of-flight of ultrasonic pulses only.

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 583-2, *Non-destructive testing — Ultrasonic examination — Part 2: Sensitivity and range setting*

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

3 Terms and definitions

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

4 Measurement modes

The thickness of a part or structure is determined by accurately measuring the time required for a short ultrasonic pulse generated by a transducer to travel through the thickness of the material once, twice or several times.

The material thickness is calculated by multiplying the known sound velocity of the material with the transit time and dividing by the number of times the pulse transits the material wall.

This principle can be accomplished by applying one of the following modes, see Figure 1:

- a) Mode 1: Measure the transit time from an initial excitation pulse to a first returning echo, minus a zero correction to account for the thickness of the transducer wear surface and the couplant layer (single echo mode).
- b) Mode 2: Measure the transit time from the end of a delay line to the first backwall echo (single echo delay line mode).
- c) Mode 3: Measure the transit time between back-wall echoes (multiple echoes).
- d) Mode 4: Measure the transit time for a pulse travelling from the transmitter to a receiver in contact with the back-wall (through transmission mode).