

Non-destructive testing - Acoustic emission - Equipment characterisation - Part 1: Equipment description

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Equipment characterisation - Part 1: Equipment
description

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 13477-1:2001 sisaldab Euroopa standardi EN 13477-1:2001 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.06.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 13477-1:2001 consists of the English text of the European standard EN 13477-1:2001.</p> <p>This document is endorsed on 18.06.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: This European Standard describes the main components that constitute an acoustic emission (AE) monitoring system comprising: detection, signal conditioning, signal measurement, analysis and output of results.</p>	<p>Scope: This European Standard describes the main components that constitute an acoustic emission (AE) monitoring system comprising: detection, signal conditioning, signal measurement, analysis and output of results.</p>
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ICS 19.100

Võtmesõnad: amplifiers, analysis, nondestructive tests, properties, recording, recordings, results, shields, signals, sound propagation, sound transmission, test equipment, testing, testing conditions, transient, treatment, waveforms, vocabulary

ICS 19.100

English version

Non-destructive testing

Acoustic emission – Equipment characterisation

Part 1: Equipment description

Essais non destructifs – Emission
acoustique – Caractérisation de
l'équipement – Partie 1: Description
de l'équipement

Zerstörungsfreie Prüfung –
Schallemissionsprüfung –
Gerätecharakterisierung – Teil 1:
Gerätebeschreibung

This European Standard was approved by CEN on 2000-12-28.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard 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 July 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make normative reference to this European Standard.

This standard about "Non destructive testing - Acoustic emission - Equipment characterisation" consists of the following parts:

Part 1: Equipment description

Part 2: Verification of operating characteristics

Part one of this standard gives a description of the main components of an AE monitoring system.

Part two of this standard gives methods and acceptance criteria for verifying the electronic performance of an AE monitoring system. These methods and acceptance criteria are used to routinely check and verify the performance of an AE monitoring system composed of one or more channels during its life time.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European standard describes the main components that constitute an acoustic emission (AE) monitoring system comprising:

- detection,
- signal conditioning,
- signal measurement,
- analysis and output of results.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 1330-1, *Non destructive testing - Terminology - Part 1: List of general terms*

EN 1330-2, *Non destructive testing - Terminology - Part 2: Terms common to the non destructive testing methods*

EN 1330-9, *Non destructive testing - Terminology - Part 9: Terms used in acoustic emission testing*

3 Terms and definitions

For the purpose of this standard the definitions given in EN 1330-1, EN 1330-2, EN 1330-9 and IEC 60050 International Electrotechnical Vocabulary and the following apply:

average signal level (ASL)

rectified, time averaged AE signal.

4 Detection

A piezoelectric sensor is the most commonly used device for detecting acoustic emission. It provides the most effective conversion of elastic waves (acoustic emission) into an electrical signal in the frequency range most commonly used for AE detection, 20 kHz - 1 MHz. In its simplest form it consists of a piezoelectric crystalline or ceramic element, mounted in a protective case. The sensor detects a combination of wave types: compressional, shear, surface (Rayleigh), plate (Lamb), arriving from any direction.

4.1 Sensing element

The sensing material affects the conversion efficiency, operating temperature range and cable drive capability. Lead zirconate titanate (PZT), a ceramic, is the most commonly used material. It can be manufactured in a wide range of sizes and shapes.

The size, shape and containment affect the sensitivity, directionality, frequency response and wave-mode response. Several elements may be combined to achieve a desired performance.