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English Version

## Non destructive testing - Acoustic emission - General principles

Essais non destructifs - Émission acoustique - Principes  
généraux

Zertörungsfreie Prüfung - Schallemission - Allgemeine  
Grundsätze

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 138.

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## Foreword

This document (prEN 13554:2009) has been prepared by Technical Committee CEN/TC 138 “Non-destructive testing”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13554:2002.

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## 1 Scope

This European Standard specifies the general principles required for the acoustic emission (AE) testing of industrial structures, components, and different materials under stress and for harsh environment, in order to provide a defined and repeatable performance. It includes guide lines for the preparation of application documents, which describe the specific requirements for the application of the AE method.

Unless otherwise specified in the referencing documents, the minimum requirements of this standard are applicable.

## 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 1330-1:1998, *Non destructive testing — Terminology — Part 1: List of general terms*

EN 1330-2:1998, *Non destructive testing — Terminology — Part 2: Terms common to the non-destructive testing methods*

EN 1330-9:2009, *Non-destructive testing — Terminology — Part 9: Terms used in acoustic emission testing*

EN 13477-2, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 2: Verification of operating characteristic*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1330-1:1998, EN 1330-2:1998 and EN 1330-9:2009 apply.

## 4 Personnel qualification

It is assumed that emission testing is performed by qualified and capable personnel. In order to prove this qualification, it is recommended to certify the personnel in accordance with EN 473 or equivalent.

**NOTE** For pressure equipment see directive 97/23/EC, annex I, 3.1.3: "For pressure equipment in categories III and IV, the personnel must be approved by a third-party organization recognized by a Member State."

## 5 Principle of the acoustic emission method

### 5.1 The acoustic emission (AE) phenomenon

Acoustic emission is a physical phenomenon whereby transient elastic waves are generated within a material or by a process.

The application of load or harsh environment in a material produces internal structural modifications such as local plastic deformation, crack growth, corrosion, erosion and phase transformations. AE sources also arise from impact, leakage (turbulent flow), cavitation, electric discharge and friction. All these mechanisms and processes are generally accompanied by the generation of elastic waves that propagate in materials or into ambient liquids. The waves therefore contain information on the internal behaviour of the material and/or structure.