
**Non-destructive testing — Acoustic
emission inspection — Primary calibration
of transducers**

*Essais non destructifs — Contrôle par émission acoustique — Étalonnage
primaire des transducteurs*



Contents

Page

1	Scope	1
2	Normative references	1
3	Definitions	1
4	Symbols and abbreviation	2
5	General requirements	2
6	Apparatus	4
7	Calibration data processing	8
8	Error analysis	11
9	Typical calibration results	12
Annex		
A	Bibliography	24

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 12713 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 3, *Acoustical methods*.

Annex A of this International Standard is for information only.

Introduction

The acoustic emission method of non-destructive testing is one of the methods addressed by SC 3 on acoustical methods, of TC 135 on non-destructive testing. Standards for general procedures and requirements are required in order to ensure quantitative results and wide applicability. This International Standard addresses one method for the primary calibration of acoustic emission transducers. It is anticipated that as other methods of determining transducer sensitivity and phase response are documented, this International Standard will be appended. This International Standard was first introduced by the USA at the fifth meeting of ISO/TC 135/SC 3 in Berlin, April 1989.

Non-destructive testing — Acoustic emission inspection — Primary calibration of transducers

1 Scope

This International Standard specifies a method for the absolute calibration of acoustic emission transducers. The aim of this International Standard is to establish uniformity of acoustic emission testing in order to form a basis for data correlation and to provide for the interpretation of results obtained by different laboratories at different times.

An accepted method for the calibration of acoustic emission transducers must be specified to characterize their behaviour.

This International Standard establishes a method for the primary calibration of acoustic emission transducers as receivers of elastic waves at the surface of a solid medium. The calibration yields the frequency response of a transducer to waves of the type normally encountered in acoustic emission work. The transducer voltage response is determined at discrete frequency intervals of approximately 10 kHz up to 1 MHz. The input is a given well-established dynamic displacement of the mounting surface. The units of the calibration are output voltage per unit mechanical input (displacement, velocity or acceleration). This International Standard is applicable to secondary standard transducers and to acoustic emission applications transducers.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ASTM E 114-95, *Ultrasonic Pulse-Echo Straight-Beam Examination by the Contact Method*.

ASTM E 494-95, *Measuring Ultrasonic Velocity in Materials*.

ASTM E 610-82¹⁾, *Standard Definitions of Terms Relating to Acoustic Emission*.

ASTM E 650-85(1992)e1, *Mounting Piezoelectric Acoustic Emission Sensors*.

BRECKENRIDGE, F.R. and GREENSPAN, M. *Surface-Wave Displacement: Absolute Measurements Using a Capacitive Transducer*, Journal Acoustic Society of America, Vol. 69, pp.1177-1185.

3 Definitions

An ISO glossary of terms used in acoustic emissions is not yet available. In view of this, for the purposes of this International Standard, ASTM E 610 shall be used as a guide.