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Non-destructive testing — Acoustic emission testing (AT) — Leak detection by means of acoustic emission

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Foreword

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This document was prepared by Technical Committee ISO/TC 135*, Non-destructive testing*, Subcommittee SC 9, *Acoustic emission testing,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 138, *Non-destructive testing,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 18081:2016), which has been technically revised.

The main changes are as follows:

— Figure 1 has been improved;

— term “AT equipment” has been replaced by “AE instrument” in the whole document;

— term “system” has been replaced by “instrument” in the whole document;

— Figure 2 showing an adjustable air jet has been added;

— Formula (1) has been corrected;

— Table 2 “Leakage grading and the influence of leak flow dynamic on AE activity“ has been added;

— editorial corrections throughout the document.

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Non-destructive testing — Acoustic emission testing (AT) — Leak detection by means of acoustic emission

1 Scope

This document specifies the general principles required for leak detection by acoustic emission testing (AT). It is addressed to the application of the methodology on structures and components, where a leak flow as a result of pressure differences appears and generates acoustic emission (AE).

It describes phenomena of the AE generation and influence of the nature of fluids, shape of the gap, wave propagation and environment.

The different application techniques, instrumentation and presentation of AE results are discussed. Also included are guidelines for the preparation of application documents which describe specific requirements for the application of the acoustic emission testing.

Annex A gives procedures for some leak-testing applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 12716, *Non-destructive testing — Acoustic emission inspection — Vocabulary*

ISO/TS 18173, *Non-destructive testing — General terms and definitions*

EN 1330-1, *Non-destructive testing — Terminology — Part 1: 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*

EN 13477-1, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 1: Equipment description*

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

EN 13554, *Non-destructive testing — Acoustic emission testing — General principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12716, ISO/TS 18173, EN 1330-1, EN 1330-2 and EN 1330-9 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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