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Non-destructive testing — Ultrasonic inspection — Evaluating electronic characteristics of ultrasonic test instruments

Essais non destructifs — Contrôle aux ultrasons — Évaluation des caractéristiques électroniques des instruments d'essai aux ultrasons



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12710 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 3, *Acoustical methods*.

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Introduction

In ultrasonic non-destructive testing, pulse/echo signals are used to detect and evaluate imperfections or flaws inside a structural material. The pulse/echo ultrasonic signals are generated by various types of electronic instruments.

This International Standard describes a set of procedures for the measurement of performance characteristics in an ultrasonic test instrument that has a display screen. The procedures are used for ultrasonic test instruments operating in a nominal frequency range from 100 kHz to 25 MHz, although the procedures are also applicable to measurements on instruments utilizing higher-frequency components. The recommended techniques are designed to use commercially-available instrumentation. An ultrasonic test instrument that cannot be completely described as a combination of the electronic sections discussed in this practice can be partially evaluated. Each portion of the ultrasonic test instrument that is evaluated should fit the description for the corresponding section.

Implementation of these practices may require more detailed procedural instruction. Competence in the use of the electronic instrumentation specified is a prerequisite for effective use of these procedures. Careful selection of the specific measurements to be made is recommended. If the related parameter is not relevant to the intended application, its measurement may be unnecessary; e.g., vertical linearity may be irrelevant for an application using a single-level flaw alarm, while horizontal linearity might be required only for accurate flaw-depth or thickness measurement from the instrument display.

No minimum interval between instrument evaluations is recommended or implied. The accuracy of each measurement is dependent upon the combined accuracy of each of the electronic measuring instruments (which should be described in the specifications and calibrations for these instruments) and the precision associated with reading the values of each part of the system. It is assumed that the precision of measuring the vertical and horizontal values from the screen of the ultrasonic test instrument is ± 1 mm.

Specifically, this International Standard intends to provide techniques and procedures to achieve the following objectives:

- a) To measure performance characteristics of components of ultrasonic test instruments.
- b) To check and ensure consistent performance of such components during the life span of the instrument.
- c) To select and specify characteristics necessary for proper overall performance of the instrument.
- d) To achieve interchangeability with similar components or similar overall instruments for same type inspections.
- e) To provide a base for the correlation and comparison of performance results from different instruments and testing sources.

NOTE These procedures are not intended to preclude the use or application of ultrasonic test equipment for which some or all of the measurement techniques of this document are not applicable. Additionally, it is not intended, nor is it applicable, as a specification defining the performance of ultrasonic test systems. If such performance criteria are required, they must be agreed upon by the using parties.