



Designation: E 317 – 9401

An American National Standard

Standard Practice for Evaluating Performance Characteristics of Ultrasonic Pulse- Echo Testing Examination Instruments and Systems ~~W~~ without the Use of Electronic Measurement Instruments¹

This standard is issued under the fixed designation E 317; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice describes procedures for evaluating the following performance characteristics of ultrasonic pulse-echo ~~testing examination instruments and systems: Horizontal Limit and Linearity; Vertical Limit and Linearity; Resolution - Entry Surface and Far Surface; Sensitivity and Noise; Accuracy of Calibrated Gain Controls.~~ Relevant terminology can Evaluation of these characteristics is intended to be used for comparing instruments and systems or, by periodic repetition, for detecting long-term changes in Terminology E 1316 the characteristics of a given instrument or system that may be indicative of impending failure, and IEEE Standard 100, which, if beyond certain limits, will require corrective maintenance. Instrument characteristics measured in accordance with this practice are expressed in terms that relate to their potential usefulness for ultrasonic examinations. Instrument characteristics expressed in purely electronic terms may be measured as described in E 1324.

1.2 Ultrasonic ~~test examination~~ systems using pulsed-wave trains and A-scan presentation (rf or video) may be evaluated.

1.3 The procedures are applicable to shop or field conditions; additional electronic measurement instrumentation is not required.

1.4 This practice establishes no performance limits for ~~test examination~~ systems; if such acceptance criteria are required, these must be specified by the using parties. Where acceptance criteria are implied herein they are for example only and are subject to more or less restrictive limits imposed by customer's and end user's controlling documents.

1.5 The specific parameters to be evaluated, conditions and frequency of test, and report data required, must also be determined by the user.

1.6 This practice ~~is intended primarily~~ may be used for the evaluation of a complete ~~testing examination~~ system, including search unit, instrument, interconnections, fixtures and fixtures. ~~However, certain characteristics connected alarm and auxiliary devices, primarily in cases where such a system is used repetitively without change or substitution. This practice is not intended to be used as a substitute for calibration or standardization of the an instrument alone can be determined within the or system to~~

¹ This practice is under the jurisdiction of ASTM Committee E-7 E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.06 on Ultrasonic Testing Procedures.

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