



Standard Guide for Planar Flaw Height Sizing by Ultrasonics¹

This standard is issued under the fixed designation E2192; 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.

1. Scope*

1.1 This guide provides tutorial information and a description of the principles and ultrasonic examination techniques for measuring the height of planar flaws which are open to the surface. The practices and technology described in this standard guide are intended as a reference to be used when selecting a specific ultrasonic flaw sizing technique as well as establishing a means for instrument standardization.²

1.2 This standard guide does not provide or suggest accuracy or tolerances of the techniques described. Parameters such as search units, examination surface conditions, material composition, etc. can all have a bearing on the accuracy of results. It is recommended that users assess accuracy and tolerances applicable for each application.

1.3 This guide does not purport to provide instruction to measure flaw length.

1.4 This standard guide does not provide, suggest, or specify acceptance standards. After flaw-sizing evaluation has been made, the results should be applied to an appropriate code or standard that specifies acceptance criteria.

1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:³

E1316 Terminology for Nondestructive Examinations

¹ This guide is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.06 on Ultrasonic Method.

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² This Standard Guide is adapted from material supplied to ASTM Subcommittee E07.06 by the Electric Power Research Institute (EPRI).

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E543 Specification for Agencies Performing Nondestructive Testing

2.2 ASNT Standards⁴

SNT-TC-1A Personnel Qualification and Certification in Nondestructive Testing

ANSI/ASNT-CP-189 Standard for Qualification and Certification of Nondestructive Testing Personnel

2.3 AIA Standards⁵

NAS-410 Nondestructive Testing Personnel Qualification and Certification

3. Terminology

3.1 *Definitions*—Related terminology is defined in Terminology **E1316**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *corner reflection*—the reflected ultrasonic energy resulting from the interaction of ultrasound with the intersection of a flaw and the component surface at essentially 90 degrees.

3.2.2 *doublet*—two ultrasonic signals that appear on the screen simultaneously and move in unison as search unit is manipulated toward and away from the flaw. During tip-diffraction flaw sizing, the flaw tip signal and flaw base signal (corner reflector) will appear as a doublet.

3.2.3 *far-surface*—the surface of the examination piece opposite the surface on which the search unit is placed. (For example, when examining pipe from the outside surface the far-surface would be the inside pipe surface).

3.2.4 *focus*—the term as used in this document applies to dual crossed-beam search units that have been manufactured so that they have a maximum sensitivity at a predetermined depth or sound path in the component. Focusing effect may be obtained with the use of dual-element search units having both refracted and roof angles applied to each element.

3.2.5 *near-surface*—the surface of the examination piece on which the search unit is placed. (For example, when examining pipe from the outside surface the near-surface would be the outside pipe surface).

⁴ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlington Ln., Columbus, OH 43228-0518, <http://www.asnt.org>

⁵ Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, <http://www.aia-aerospace.org>.

*A Summary of Changes section appears at the end of this standard