



Standard Practice for Magnetic Particle Examination of Steel Forgings Using Alternating Current¹

This standard is issued under the fixed designation A966/A966M; 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 practice covers a procedure for the magnetic particle examination of steel forgings using alternating current as the power source. The procedure will produce consistent results upon which acceptance standards can be based. This practice does not contain acceptance limits or recommended quality levels.

1.2 Only alternating 50–60 cycle current shall be used as the electric power source for any of the magnetizing methods.

1.3 When subsurface indications are sought in forgings, then dc magnetization in accordance with Practice [A275/A275M](#) should be used.

1.4 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. Unless the order specifies the applicable “M” specification designation [SI units], the inch-pound units shall be used.

1.5 *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 limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[A275/A275M Practice for Magnetic Particle Examination of Steel Forgings](#)

¹ This practice is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.06 on Steel Forgings and Billets.

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² 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.

[A508/A508M Specification for Quenched and Tempered Vacuum-Treated Carbon and Alloy Steel Forgings for Pressure Vessels](#)

[A788/A788M Specification for Steel Forgings, General Requirements](#)

[A963/A963M Specification for Deep Drawing Steel \(DDS\), Sheet, Carbon, Cold-Rolled \(Withdrawn 2000\)](#)³

2.2 Other Document:

[Practice No. SNT-TC-1A, Supplement B—Magnetic Particle Method](#)⁴

3. Terminology

3.1 Definitions:

3.1.1 *(ac) magnetic particle method of examination, n*—a method for detecting discontinuities on the surface in suitably magnetized materials, which employs finely divided magnetic particles that tend to congregate in regions of leakage fields.

3.1.2 *indication, n*—the visual magnetic particle buildup resulting from leakage fields in the magnetic field.

3.1.3 *linear indication, n*—an indication in which the length is at least three times the width. The minimum length of indications to be considered linear shall be 1/16 in. [1.5 mm].

3.1.4 *magnetic flux, n*—the product of the magnetic induction and the area of a surface (or cross section) when the magnetic induction is uniformly distributed and normal to the plane of the surface.

3.1.4.1 *Discussion*—The concept that the magnetic field is flowing along the lines of force suggests that these lines are therefore “flux” lines, and they are called magnetic flux.

3.1.5 *nonrelevant indications, n*—indications produced by leakage fields where the conditions causing them are present by accident or part design, or other features of the part having no relation to the damaging flaws being sought.

3.1.5.1 *Discussion*—This term signifies that such an indication has no relation to the discontinuities that might constitute defects.

³ The last approved version of this historical standard is referenced on www.astm.org.

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

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