



Standard Practice for Liquid Penetrant Examination¹

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1. Scope

1.1 This practice establishes the minimum requirements for conducting liquid penetrant examination of nonporous metal, and nonmetal components.

1.2 The penetrant examination processes described in this practice are applicable to in-process, final, and maintenance (in-service) inspections. These processes are applicable for the detection of discontinuities, such as lack of fusion, corrosion, cracks, laps, cold shuts, and porosity, that are open or connected to the surface of the component under examination.

1.3 Caution must be exercised in the usage of elevated temperature with components manufactured from thermoplastic materials. Also, some cleaners, penetrants, and developers can have a deleterious effect on nonmetallic materials such as plastics. Prior to examination, tests should be conducted to ensure that none of the cleaning or inspection materials are harmful to the components to be examined.

1.4 The values stated in inch-pound units are regarded as standard. The SI units given in parentheses are for information only.

1.5 All areas of this practice may be open to agreement between the cognizant engineering organization and the supplier, or specific direction from the cognizant engineering organization.

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 limitations prior to use.* Specific precautionary statements are given in Notes 2 and 3.

2. Referenced Documents

2.1 The following documents form a part of this practice to the extent specified herein:

2.2 ASTM Standards:

D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation²

D 2512 Test Method for Compatibility of Materials with

Liquid Oxygen (Impact Sensitivity Threshold and Pass-Fail Technique)³

E 165 Test Method for Liquid Penetrant Examination⁴

E 543 Practice for Evaluating Agencies that Perform Non-destructive Testing⁴

E 1135 Test Method for Comparing the Brightness of Fluorescent Penetrants⁴

E 1316 Terminology for Nondestructive Examinations⁴

2.3 ASNT Document

ANSI/ASNT-CP-189 Standard for Qualification and Certification of Nondestructive Testing Personnel⁵

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing⁵

2.4 Military Standards:⁶

MIL-I-25135 Inspection Materials, Penetrant⁷

QPL 25135 Qualified Products of, Inspection Materials, Penetrant⁷

MIL-STD-410 Nondestructive Testing Personnel Qualification and Certification⁷

MIL-STD-792 Identification Marking Requirements for Special Purpose Components⁷

MIL-STD-1907 Liquid Penetrant and Magnetic Particle, Soundness Requirements for Materials, Parts, and Weldments⁷

MIL-STD-2175 Castings Classification and Inspection of⁷

QPL-AMS-2644 Qualified Products List, Inspection Material, Penetrant⁷

MIL-STD-6866 Inspection, Penetrant Method of⁷

MIL-STD-45662 Calibration System Requirements⁷

2.5 ANSI/ISO/AIA Standards:⁸

ANSI/NCSL Z540-1 General Requirement for Calibration Laboratories and Measuring Test Equipment

ISO 10012-1 Quality Assurance Requirements for Measuring Test Equipment

³ Annual Book of ASTM Standards, Vol 15.03.

⁴ Annual Book of ASTM Standards, Vol 03.03.

⁵ Available from American Society for Nondestructive Testing, 1711 Arlington Plaza, P.O. Box 28518, Columbus, OH 43228-0518.

⁶ Copies of specifications, standards, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁸ Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.

¹ This practice is under the jurisdiction of ASTM Committee E-7 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.03 on Liquid Penetrant and Magnetic Particle Methods.

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² Annual Book of ASTM Standards, Vol 05.01.

