



Standard Test Method for Liquid Penetrant Examination¹

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1. Scope

1.1 This test method² covers procedures for penetrant examination of materials. They are nondestructive testing methods for detecting discontinuities that are open to the surface such as cracks, seams, laps, cold shuts, laminations, through leaks, or lack of fusion and are applicable to in-process, final, and maintenance examination. They can be effectively used in the examination of nonporous, metallic materials, both ferrous and nonferrous, and of nonmetallic materials such as glazed or fully densified ceramics, certain nonporous plastics, and glass.

1.2 This test method also provides a reference:

1.2.1 By which a liquid penetrant examination process recommended or required by individual organizations can be reviewed to ascertain its applicability and completeness.

1.2.2 For use in the preparation of process specifications dealing with the liquid penetrant examination of materials and parts. Agreement by the user and the supplier regarding specific techniques is strongly recommended.

1.2.3 For use in the organization of the facilities and personnel concerned with the liquid penetrant examination.

1.3 This test method does not indicate or suggest criteria for evaluation of the indications obtained. It should be pointed out, however, that after indications have been produced, they must be interpreted or classified and then evaluated. For this purpose there must be a separate code or specification or a specific agreement to define the type, size, location, and direction of indications considered acceptable, and those considered unacceptable.

1.4 The values stated in inch-pound units are to be regarded as the standard. SI units are provided for information only.

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.* For specific hazard statements, see Note 5, Note 12, and Note 20.

2. Referenced Documents

2.1 ASTM Standards:

D 129 Test Method for Sulfur in Petroleum Products (General Bomb Method)³

D 516 Test Method for Sulfate Ion in Water⁴

D 808 Test Method for Chlorine in New and Used Petroleum Products (Bomb Method)³

D 1193 Specification for Reagent Water⁴

D 1552 Test Method for Sulfur in Petroleum Products (High-Temperature Method)³

D 4327 Test Method for Anions in Water by Chemically Suppressed Ion Chromatography⁴

E 433 Reference Photographs for Liquid Penetrant Inspection⁵

E 543 Practice for Evaluating Agencies that Perform Nondestructive Testing⁵

E 1208 Test Method for Fluorescent Liquid Penetrant Examination Using the Lipophilic Post-Emulsification Process⁵

E 1209 Test Method for Fluorescent Liquid Penetrant Examination Using the Water-Washable Process⁵

E 1210 Test Method for Fluorescent Liquid Penetrant Examination Using the Hydrophilic Post-Emulsification Process⁵

E 1219 Test Method for Fluorescent Liquid Penetrant Examination Using the Solvent-Removable Process⁵

E 1220 Test Method for Visible Penetrant Examination Using the Solvent-Removable Process⁵

E 1316 Terminology for Nondestructive Examinations⁵

E 1418 Test Method for Visible Penetrant Examination Using the Water-Washable Process⁵

2.2 ASNT Document:

Recommended Practice SNT-TC-1A for Nondestructive Testing Personnel Qualification and Certification⁶

2.3 Military Standard:

MIL-STD-410 Nondestructive Testing Personnel Qualification and Certification⁷

¹ This test method 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 For ASME Boiler and Pressure Vessel Code applications see related Recommended Test Method SE-165 in the Code.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 11.01.

⁵ *Annual Book of ASTM Standards*, Vol 03.03.

⁶ Available from the American Society for Nondestructive Testing, 1711 Arlington Lane, Columbus, OH 43228-0518.

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