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**INTERNATIONAL**

400 Commonwealth Drive, Warrendale, PA 15096-0001

Submitted for recognition as an American National Standard

**AEROSPACE  
STANDARD**



**AS7114/1**

Issued 1997-07  
Superseding AS71001/1A

**NADCAP  
REQUIREMENTS FOR NONDESTRUCTIVE TESTING FACILITY  
PENETRANT SURVEY**

**1. SCOPE:**

This Aerospace Standard (AS) is to be used to supplement AS7114. In addition to the requirements contained in AS7114, the requirements contained herein shall apply to suppliers seeking NADCAP accreditation for Penetrant Nondestructive Testing.

When customer requirements differ from those specified herein, the customer requirements shall take precedence.

**2. REFERENCES:**

**2.1 SAE Publications**

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15086-0001.

- AS7003 National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Program Operation
- AS7114 National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Nondestructive Testing

**2.2 U.S. Government Publications**

Available from DODSSP Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

- MIL-STD-410 Nondestructive Personnel Qualification and Certification
- MIL-STD-6866 Inspection, Liquid Penetrant
- MIL-STD-45662 Calibration Systems Requirements
- MIL-I-25135 Inspection Materials, Penetrants
- QPL-25135 Qualified Products List

**2.3 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.**

- ASTM D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation

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### 3. MATERIALS AND EQUIPMENT:

- 3.1 All penetrant materials/combinations used shall be in accordance with customer requirements. There shall be no additional procurement of materials that are not on the current revision of QPL-25135, or approved for listing on the next revision of QPL-25135, without customer approval.
- 3.2 The facility shall have traceability to manufacturer's certifications for each batch of penetrant, emulsifier, and developer in use.
- 3.3 Contents of all tanks/drums shall be labeled as to material and batch number.
- 3.4 All tanks in the system shall be arranged/covered to prevent mixing of materials.

### 4. PROCEDURES:

#### 4.1 NDT Facility Written Procedures:

- 4.1.1 There shall be a statement in the procedure or quality manual requiring that as a minimum customer requirements shall be met.
- 4.1.2 There shall be written inspection procedures, general and/or specific, containing the following information as applicable:
  - a. The procedure I.D. number or applicable program, if program specific
  - b. Date of approval
  - c. Approval by Level III
  - d. Listing of deviations and approval by customer, when applicable
  - e. Requirement that all personnel are qualified and certified to appropriate level
  - f. The part number and/or material to be examined
  - g. Equipment to be used including any unique requirements for automated versus manual equipment
  - h. Requirements for precleaning and/or etching process including materials, processing times, metal removal, and drying parameters, part masking and other part preparations
  - i. Brand name and specific type of penetrant, sensitivity level, emulsifier, developer, and classifications in accordance with MIL-I-25135
  - j. Complete processing parameters for the penetrant inspection materials including dwell times, application methods, drying times, concentrations of emulsifiers, temperatures, and controls to prevent excessive drying or overheating, as appropriate
  - k. Methods of removing excess penetrant, drying, spray nozzle type, water pressure and water temperature, hydro-air nozzles, and air pressure
  - l. Method of developer applications
  - m. Evaluation procedure including black light intensity, white light intensity, inspection booth ambient white light intensity, dark adaptation time, prohibition of photochromic lenses, acceptance criteria, and controls for mechanical evaluation and solvent cleaning evaluation
  - n. Identification of the components or areas within a component to be inspected
  - o. Applicable acceptance class for component and/or zone in accordance with engineering drawing and/or specification
  - p. Any special equipment required including type and intensity of light, if different from standard processing
  - q. When required, complete post-cleaning procedures
  - r. Method and location of marking parts, if applicable

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### 4.1.2 Continued:

- s. Method for control of software or programming used for automated processing equipment as applicable
- t. Provisions for process control tests and checks to be performed

### 4.1.3 If applicable, there shall be procedures defining handling of special material and processing of parts as required by customer.

## 5. LABORATORY PROCESS CONTROLS:

### 5.1 Penetrant Brightness Test (Reused):

The fluorescent brightness of in-use penetrant shall be tested.

- a. This test shall be performed at least quarterly.
- b. The test procedure shall be in accordance with MIL-I-25135, Para. 4.5.7.
- c. The minimum acceptable limit shall be 90%.
- d. Records of this test shall be on file.
- e. The test records shall indicate acceptable results.
- f. The facility shall be capable of demonstrating this check or provide documentation of acceptable results from a testing laboratory.

### 5.2 Water Content of Water-Washable Penetrants (Reused):

- a. The water content of in-use Method A penetrants shall be tested.
- b. The test results shall be documented.
- c. This test shall be performed at least monthly.
- d. A standard test (e.g., ASTM D 95) method shall be used.
- e. The maximum acceptable limit used shall be 5% or the facility shall demonstrate that the acceptability limit is in accordance with customer requirements.
- f. The test records shall indicate acceptable results.
- g. The facility shall be capable of demonstrating this check or provide documentation of acceptable results from a testing laboratory.

### 5.3 Water Content of Lipophilic Emulsifiers (Reused):

- a. The water content of in-use Method B emulsifier shall be tested.
- b. The test results shall be documented.
- c. This check shall be performed at least monthly.
- d. A standard test (e.g., ASTM D 95) method shall be used.
- e. The maximum acceptable limit used shall be 5% or the facility shall demonstrate that the acceptability limit is in accordance with customer requirements.
- f. The test records shall indicate acceptable results.
- g. The facility shall be capable of demonstrating this check or provide documentation of acceptable results from a testing laboratory.