

AEROSPACE MATERIAL SPECIFICATION



AMS 7295C

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Radiographic Film and Paper
Industrial Grade

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1. SCOPE:

1.1 Form:

This specification and its supplementary detail specifications cover radiographic film and paper in the form of cut sheet or rolls.

1.2 Application:

These products have been used typically for recording, for permanent record, the radiographic images of parts, but usage is not limited to such applications.

1.3 Classification:

Radiographic film and paper shall be as specified in the applicable detail specification, wherein each product is defined by radiographic characteristics. An example is shown in 8.2. The product covered by each detail specification appears as part of the title.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 3608 Plastic Sheet, Methyl Methacrylate, General Purpose

AMS 5044 Steel Sheet and Strip, 0.15 Carbon, maximum, Half Hard Temper

AMS 504 Steel Sheet and Strip, 0.25 Carbon, maximum, Hard Temper

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM E 94 Radiographic Testing

ASTM E 142 Controlling Quality of Radiographic Testing

ASTM E 1079 Calibration of Transmission Densitometers

ASTM F 288 Tungsten Wire for Electron Devices and Lamps

2.3 U.S. Government Publications:

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

MIL-STD-453 Inspection, Radiographic
MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

2.4 ANSI Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI PH2.8 Sensitometry of Industrial X-Ray Films for Energies up to 3 Million Electron Volts

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications:

The requirements for a specific product shall consist of all requirements specified herein in addition to requirements specified in the applicable detail specification. In case of conflict between requirements of this basic specification and the applicable detail specification, requirements of the detail specification shall govern.

3.2 Material:

3.2.1 Film:

3.2.1.1 Film Base: Shall be polyester or other transparent material known in the industry as "safety film" and shall be clear or slightly color-tinted.

3.2.1.2 Thickness: Shall be as specified in the applicable detail specification.

3.2.1.3 Optical Density: Shall be as specified in the applicable detail specification, determined in accordance with 4.5.1.

3.2.2 Paper:

3.2.2.1 Paper Base: Composition of the paper shall be optional with the manufacturer and shall be essentially white.

3.2.2.2 Thickness: Shall be as specified in the applicable detail specification.

3.2.2.3 Reflection Density: Shall be as specified in the applicable detail specification, determined in accordance with 4.5.1.

- 3.2.3 Emulsion Coating: Shall be a silver-bearing emulsion of composition optional with the manufacturer and consistent with requirements specified herein and in the applicable detail specification.
- 3.2.3.1 Thickness: Shall be optional with the manufacturer.
- 3.2.3.2 Adhesion: There shall be no delamination of the emulsion from the base material at any time up to 12 months storage of unexposed film or paper. The product shall withstand handling, processing, examination, and storage in accordance with manufacturer's recommendations for up to five years from exposure date with no delamination of emulsion from the base material.
- 3.3 Radiographic Properties:
- 3.3.1 Gradient: The product shall exhibit gradient or contrast values as specified in the applicable detail specification, determined in accordance with 4.5.2.
- 3.3.2 Resolution: The product shall exhibit resolution values as specified in the applicable detail specification, determined in accordance with 4.5.3.
- 3.3.3 Radiographic Quality Level: Shall be such that a product supplied to this specification and the applicable detail specification, exposed, and processed in accordance with manufacturer's recommendations, shall yield radiographs of at least 2-2T sensitivity as defined and determined in accordance with ASTM E 94 and ASTM E 142.
- 3.3.4 Response to Radiographic Exposure:
- 3.3.4.1 Film: The manufacturer shall determine for each product the speed of response to radiation exposure at two of the four energy levels specified in ANSI PH2.8, one level being 100 kV X-rays with no lead screen. The speed shall be expressed as the reciprocal of the exposure in roentgens (C/kg) required to produce a density of 2.0 H&D units, +0.1, -0, above the base and fog density (net density of 2.0) under the standard conditions of exposure and processing specified in ANSI PH2.8. The speed of response and the description of the filters used shall be reported in the preproduction test data submitted in accordance with 4.4.1. When requested, film speed at a net density of 2.0 H&D units, determined in accordance with ANSI PH2.8, shall be reported in reciprocal roentgens (reciprocal C/kg) for each lot or emulsion number.
- 3.3.4.2 Paper: The manufacturer shall determine for each product the speed of response to radiation exposure at two of the four energy levels specified in ANSI PH2.8, one level being 100 kV X-rays using fluorescent screens of a prescribed type, the other using appropriate lead screens. The speed shall be expressed as the reciprocal of the exposure in roentgens (C/kg) required to produce a reflection density of 0.8 H&D units, +0.5, -0, above the fog density (net density of 0.8) under the standard exposure conditions specified in ANSI PH2.8 and processing in accordance with manufacturer's recommendations. The speed of response and the description of the filters and screens used shall be reported in the preproduction test data submitted in accordance with 4.4.1. When requested, paper speed at a net density of 0.8 H&D units, determined in accordance with ANSI PH2.8, shall be reported in reciprocal roentgens (reciprocal C/kg) for each lot or emulsion number.

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, clean, unexposed, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Sizes and Tolerances:

3.5.1 Sheet: Shall be of the size ordered, +0.06, -0.04 inch (+1.5, -1.0 mm).

3.5.2 Rolls: Shall be of the width and length ordered. Width tolerance shall be +0.06, -0.04 inch (+1.5, -1.0 mm). Length tolerance shall be +1.0 inch (+25 mm), -0.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for response to radiographic exposure (3.3.4) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests for gradient (3.3.1) and resolution (3.3.2) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.2.3 Preproduction Tests: Tests for all technical requirements are preproduction tests and shall be performed prior to or on the first-article shipment of a product to a purchaser, when a change in material and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 Acceptance Tests: Sufficient product shall be taken at random from each lot to perform all required tests; a lot shall be all product produced in a single production run from the same batches of raw materials under the same fixed conditions and presented for manufacturer's inspection at one time. A lot is usually identified with an emulsion number.