AERONAUTICAL
MATERIAL SPECIFICATIONS
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AMS 2635

Issued 8-15-58
Revised

RADIOGRAPHIC INSPECTION

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: This specification details the procedure for the radiographic inspection of metals to determine the presence of cracks, porosity, blowholes, inclusions, and other imperfections considered detrimental to use of material.

3. EQUIPMENT:

3.1 General: Unless otherwise agreed upon, the radiographic equipment and procedures shall have qualification approval.

3.2 Film: Shall be high contrast, fine-grained safety film except when wide subject latitude or excessively long exposures prohibit its use.

3.3 Penetrameters: Shall be fabricated of material of the same base metal and of approximately the same density as the material to be radiographed. Dimensions shall be as shown in Figure 1.

3.3.1 For all metals and alloys other than magnesium and magnesium alloys, the penetrameter thickness shall be not greater than 2% of the thickness of the section to be radiographed, except for sections less than 1/4 in. in thickness where a penetrameter 0.005 in. thick shall be used.

3.3.2 Penetrameters of magnesium metal and magnesium alloys shall have a thickness of not greater than 3% of the thickness of the section radiographed, except that for sections less than 0.17 in. in thickness, a penetrameter 0.005 in. thick shall be used.

3.3.3 The penetrameters shall be identified with a number made of lead alloy attached thereto. This number shall be equal to the thickness, in inches, of the metal to which the penetrameter is normally applicable and shall have a value equal to 50 times the thickness of the penetrameter, except for magnesium and magnesium alloys.

3.3.3.1 Penetrameters of magnesium and of magnesium base alloys shall be identified with a number which shall have a value equal to 33 times the thickness of the penetrameter.

3.3.3.2 Penetrameters of all metals and alloys shall have suitable, permanent, identification markings so as to be distinguishable with respect to material.

3.4 Screens and filters may be used to give better definition and sensitivity.

4. PROCEDURE:

4.1 All radiographic examinations shall be performed with a technique capable of indicating the presence of imperfections having any dimension equal to 3% of the thickness of the section radiographed for magnesium and magnesium alloys and 2% for all other metals and alloys.

4.2 All significant areas as specified shall be examined. Particular attention shall be given to highly stressed areas and a sufficient number of different views shall be taken to establish the nature and extent of any discontinuities in these areas. All views established for each part will be subject to approval by the purchaser.

4.3 Unless otherwise specified, a penetrameter shall be placed on each part radiographed for the duration of the exposure, unless a number of identical parts are simultaneously exposed. In such case, a single penetrameter placed upon the surface of a part at the outer edge of the cone of radiation will suffice. Where it is impractical to place the penetrameter upon the part radiographed, it may be placed on the upper surface of a block of metal of the same composition and approximately the same thickness as the part or parts radiographed and located on the film in an area at the outer edge of the cone of radiation.

4.4 Radiographic procedure shall be adjudged correct when the image details of the penetrameter are adequately defined in all production radiographs. Control settings shall then be determined and recorded on a radiographic control card for the individual part and material. This control card shall include the part number, x-ray equipment, accessories, type of film, kilovoltage, milliamperage, exposure time, focal spot to film distance, developer, developing time, diagram of exposure setup, and other pertinent data when applicable. When an identical procedure is used for a number of parts, a single record tabulating all identical features of the procedure will be sufficient for all such parts. The radiographic procedure will be subject to approval by the purchaser.

4.5 When specified, radiographs of permanently serialized parts shall be identified with the part serial number. Radiographs of non-serialized parts shall be suitably identified pending film interpretation and final disposition of such parts.

4.6 Standards for acceptance, as agreed upon by purchaser and vendor, shall be established for disposition of inspected parts.

4.7 Interpretation of the indications revealed by radiographic inspection and final disposition of the parts shall be the responsibility of only those persons qualified by experience with radiographic inspection.

5. IDENTIFICATION: Unless otherwise specified, acceptable parts shall be identified with the authorized (X) mark together with such other characters as shall be necessary to complete inspection records. Identification of inspected parts shall be legible, and so placed that it will not interfere with normal function of the part. Marking materials shall have no deleterious effect on the parts or their performance.

5.1 Unless otherwise specified, rubber stamping of parts shall be considered an acceptable method of marking accepted parts. Methods other than rubber stamping may be used subject to agreement between purchaser and vendor.

5.2 Acceptable parts whose size or configuration does not permit marking with the authorized mark may be identified by dyeing or tagging when approved by the purchaser.

6. APPROVAL:

6.1 To assure uniformity of radiographic inspection, the equipment, procedure, and acceptance standards shall be approved by purchaser before parts are supplied, unless such approval be waived.

6.2 After approval of radiographic equipment and procedure as recorded on the radiographic control card, vendor shall make no change in equipment or procedure without written permission from purchaser prior to incorporating such change.

7. RECORDS:

7.1 Radiograph shall carry a radiographic inspection number or code letters of test to positively identify the part or parts to which it pertains.

7.2 When so requested by the purchaser, parts shall be supplied accompanied by one or more of the following: radiographs of the specific parts, reports of film interpretation, and disposition made on the parts.

7.3 Unless otherwise specified, radiographs shall be kept on file for reference purposes not less than 6 months from date of exposure.

NOTE. SIMILAR SPECIFICATIONS: (a) This specification exceeds the minimum requirements of MIL-I-6865A, Amendment 1, dated 28 June 1957, and MIL-X-6141A, Amendment 1, dated 3 June 1957

(b) MIL-I-6865 and MIL-X-6141 are listed for information only and shall not be construed as acceptable alternates unless all requirements of this AMS are met.