

# AEROSPACE MATERIAL SPECIFICATION

**SAE** A M S 2601F

Issued JUN 1940

Revised MAY 1994

Superseding AMS 2601E

Submitted for recognition as an American National Standard

## PRESSURE TESTING, GASEOUS MEDIA 10 psi

### 1. SCOPE:

This specification provides requirements and procedures for gas-pressure leak testing of parts.

1.1 MAM 2601 is the metric version of this AMS.

### 2. APPLICABLE DOCUMENTS:

There are no referenced publications specified herein.

### 3. TECHNICAL REQUIREMENTS:

#### 3.1 Equipment:

3.1.1 Fixtures: Test fixtures shall not seal off areas of possible leakage or create excessive stresses on parts.

3.1.2 Gaskets: Suitable gasket material shall be used with plugs or blanking plates to prevent damage to finished surfaces.

3.1.3 Valves: Bleeder valves shall be provided to release entrapped gas.

3.1.4 Gauges: Pressure gauges shall have sufficient dial divisions to permit monitoring of specified pressure.

3.1.5 Compressed Gas Source: The source of compressed gas shall provide the required pressure and shall be equipped with a pressure regulator to control the pressure.

3.1.6 Safety Tank or Screen: A suitable tank or screen shall be provided to protect the operator in case of failure of a part.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

3.1.7 Drying Oven: A circulating-air oven is required for drying parts subject to corrosion.

### 3.2 Test Media:

Shall be compressed gas for applying internal pressure to the part. In addition, a tank of tap water or other transparent liquid shall be provided for parts tested by immersion or liquid soap solution shall be used on parts not immersed during test.

### 3.3 Preparation:

3.3.1 Cleaning: The part shall be thoroughly cleaned before testing so that any leaks will be visible. Loose particles, machine shop chips, oils, and other foreign materials shall be removed before pressure testing.

3.3.2 Processes: The part or subassembly shall be tested following all machining, forming, straightening, welding, brazing, anodizing, etc, and prior to application of protective finishes such as paint, plating, coating, or surface finishes that may mask or blank off areas of possible leakage.

3.3.3 Preliminary Tests: Tests may be performed at any stage or manufacture in order to establish in-process integrity.

3.3.4 Material Removal: Sand blasting, pickling, or any other operation which may remove metal from surfaces shall be done before final pressure tests.

### 3.4 Procedure:

All parts to be tested shall be fitted up for test and, while subjected internally to a gas pressure of 10 to 15 psi, shall be submerged in tap water or other transparent liquid or shall have the surfaces to be tested completely coated with liquid soap solution.

3.4.1 Duration: Parts shall be held at the specified pressure for not less than three minutes to permit complete visual inspection while at the specified pressure.

3.4.2 Cleaning: Parts, which have been tested under tap water or other transparent liquid, shall be cleaned and dried, immediately after test, to prevent corrosion due to entrapment of moisture. Visible moisture shall be removed by air blast. Parts containing areas of entrapment and all magnesium parts shall be dried in a circulating-air oven at  $250^{\circ}\text{F} \pm 25$  for at least one hour.

3.4.3 Orientation: The part shall be exposed to permit overall visual inspection during static pressure application.

### 3.5 Acceptance Standards:

- 3.5.1 Parts shall not leak under pressure. The effect of any slight leakage of parts shall be considered by cognizant personnel and the parts accepted, repaired, or rejected.
- 3.5.2 The effect of any leakage of parts, other than as in 3.5.1, shall be (R) reviewed by cognizant engineering organization and parts repaired and retested or rejected.
- 3.5.3 If slight leakage appears in a line, as if indicating a crack or a cold shut, the part shall be rejected.
- 3.5.4 Magnesium alloy castings which leak in a 2-inch diameter area more than 180 mL of gas per minute shall be rejected but those that leak less may be impregnated, when so specified, and the method to be used is approved by purchaser.
- 3.5.4.1 Those sections of magnesium alloy castings, impregnated or not, which leak in a 2-inch diameter area less than 40 mL of gas per minute are acceptable unless the leakage is into the induction system of parts or through an external surface, in which case leakage is not desirable but acceptable to the extent of 0.1 mL of gas per minute in a 2-inch diameter area.

### 4. QUALITY ASSURANCE PROVISIONS:

#### 4.1 Reports:

The pressure test vendor shall furnish with each shipment a report stating that the parts have been tested in accordance with this specification and that they conform to the technical requirements. This report shall include the purchase order number, AMS 2601F, part number, and quantity.

### 5. PREPARATION FOR DELIVERY:

#### 5.1 Protective Treatment: (R)

Parts which are subject to corrosion shall be suitably preserved prior to shipment by a method acceptable to purchaser.

### 6. ACKNOWLEDGMENT:

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

### 7. REJECTIONS:

Parts that do not meet the requirements of this specification, or modifications authorized by purchaser, will be subject to rejection.