



# AEROSPACE MATERIAL SPECIFICATION

AMS2610™

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Reaffirmed 2018-08

Pressure Testing, Gaseous Media  
Pressure as Specified

## RATIONALE

AMS2610 has been reaffirmed to comply with the SAE five-year review policy.

### 1. SCOPE:

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

### 2. APPLICABLE DOCUMENTS:

There are no referenced publications specified herein.

### 3. TECHNICAL REQUIREMENTS:

#### 3.1 Equipment:

- 3.1.1 Fixtures: Test fixtures and apparatus shall be designed and constructed to seal off only the ports and passages required to pressurize the part, and to permit 100% evaluation of all areas of the part where leakage could occur. The design shall not induce any stress on the part other than that provided by the test media. If pressure testing cannot be accomplished without inducing additional stresses, the design, including fitting types, shall be approved by the purchaser.
- 3.1.2 Gaskets: Gasket material shall be used with plugs or blanking plates to prevent damage to finished surfaces. Flanges or fittings designed for use with specific O-rings or gaskets shall use those seals for test. Formed-in-place gaskets that could mask dimensions or surface flaws shall not be used except on unmachined castings when sealing.
- 3.1.3 Bleeder Ports: Valved bleeder ports shall be provided to release entrapped gas.
- 3.1.4 Gauges: Pressure gauges and flow meters shall have sufficient dial divisions or readability to permit monitoring within plus or minus 5% of specified pressure and shall have been calibrated, within one year of use, using either primary standards or standards traceable to the National Institute of Standards and Technology (NIST).

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- 3.1.5 Compressed Gas Source: A regulated source of compressed gas shall be provided to enable the part to be pressured at the specified pressure. A shut-off valve and a flow meter to measure leakage shall also be provided.
- 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 (See 8.4).
- 3.1.7 Drying Oven: A circulating-air oven is required for drying parts subject to corrosion.

### 3.2 Test Media:

Shall be compressed air, nitrogen, or inert 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; liquid soap or commercial leak detector 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 other protective finishes such as paint, plating, coating, and surface finishes that may mask or blank off areas of possible leakage.
- 3.3.3 Chemical Film and Passivation: Chemical film protective finishing of aluminum and magnesium and passivation of stainless steel may be performed either before or after pressure testing.
- 3.3.4 Impregnation: Impregnation of castings shall not be permitted except as authorized by purchaser and then only to correct general seepage leaks. Impregnation shall not be used to correct poor foundry techniques, visible holes, or excessive porosity. Impregnation, when permitted or authorized by purchaser, shall be conducted after heat treatment, brazing, and welding have been completed.
- 3.3.5 Preliminary Tests: Tests may be performed at any stage of manufacture in order to establish in-process integrity. However, requirements apply to finished parts prior to finish coating (See 3.3.2 and 3.3.3).
- 3.3.6 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 the specified gas pressure, shall be submerged in tap water or other transparent liquid or shall have the surfaces to be tested completely coated with liquid soap solution or leak detecting fluid.

- 3.4.1 Orientation: The part shall be exposed, during static pressure application, to permit overall visual inspection.
- 3.4.2 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.
- 3.4.3 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 parts subject to corrosion shall be dried in a circulating-air oven not exceeding 275 °F (135 °C) for sufficient time to ensure removal of moisture.
- 3.5 Acceptance Standards:
- 3.5.1 Parts which do not show visible sign of leakage under pressure or which meet other specified leakage limits are acceptable.
- 3.5.2 Unless otherwise specified, the following criteria shall apply:
- 3.5.2.1 Slight leakage appearing in a line, as if indicating a linear defect, is not acceptable.
- 3.5.2.2 Parts made from magnesium alloy castings which leak in a 2-inch (51-mm) diameter area more than 180 mL of gas per minute are not acceptable.
- 3.5.2.2.1 Magnesium alloy castings which leak less than 180 mL of gas per minute may be impregnated in accordance with a method acceptable to purchaser.
- 3.5.2.2.2 Those areas of impregnated or non-impregnated magnesium alloy castings which leak less than 40 mL of gas per minute are acceptable unless the leakage is into the induction system of the part.
- 3.5.2.2.3 Leakage through to an external surface of a magnesium alloy casting is acceptable to the extent of 0.1 mL of gas per minute in a 2-inch (51-mm) diameter area.
- 3.5.3 Parts failing to meet the specified acceptance criteria shall be rejected, reworked, or repaired, and retested in accordance with purchaser's requirements.
- 3.6 Marking:
- When specified, each part that has passed pressure test shall be marked with permanent ink, adjacent to other part markings, with the letter "L" unless other marking instructions are provided by purchaser.

#### 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 specified requirements and that they conform to other technical requirements. This report shall include the purchase order number, AMS 2610, test pressure, part number, and quantity.

#### 5. PREPARATION FOR DELIVERY:

##### 5.1 Protective Treatment:

Parts shall be protected from corrosion 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 which do not meet requirements of this specification, or modifications authorized by purchaser, will be subject to rejection.

#### 8. NOTES:

- 8.1 A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.
- 8.2 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.
- 8.3 Terms used in AMS are clarified in ARP1917.
- 8.4 This procedure requires visual examination of a part at close range while the part is internally pressurized. It is recommended that parts be proof pressure tested in a safety tank or screen (See 3.1.6) at a pressure higher than the leak pressure before examining for leakage at a lower test pressure.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "B"