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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE MAM 2604B

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Superseding MAM 2604A

Submitted for recognition as an American National Standard

PRESSURE TESTING, GASEOUS MEDIA 275 kPa

1. SCOPE:

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

1.1 AMS 2604 is the inch/pound version of this MAM.

2. APPLICABLE DOCUMENTS:

There are no referenced publications specified herein.

3. TECHNICAL REQUIREMENTS:

3.1 Equipment:

3.1.1 (R) Fixtures: Test fixtures shall not seal off areas of possible leakage or create excessive stresses on parts other than those induced by the pressure itself or by fittings acceptable to purchaser.

3.1.2 (R) Gaskets: Suitable 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 for test. Formed-in-place gaskets that could mask dimensions or surface flaws shall not be used except on unmachined castings.

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

3.1.4 (R) Gauges: Pressure gauges shall have divisions not more than 15 kPa apart; gauges shall have been calibrated, within 1 year of use, using either primary standards or standards traceable to the National Institute of Standards and Technology (NIST).

3.1.5 (R) Test Media Source: The source of test media 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 (See 8.2).

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

3.2 (R) 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 protective finishes such as paint, plating, coating, or surface finishes that may mask or blank off areas of possible leakage.

3.3.3 (R) Chemical Film: Chemical film protective finishes on aluminum and magnesium may be applied either before or after pressure testing.

3.3.4 (R) 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 (R) 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).

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:
(R)

All parts to be tested shall be fitted up for test and, while subjected internally to a gas pressure of 275 to 310 kPa, 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 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
(R) 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 120 °C ± 15 for sufficient time to ensure removal of moisture.

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

3.5 Acceptance Standards:

3.5.1 Parts which do not show visible signs of leakage under pressure, which meet
(R) a drawing specification, or which meet other designated leakage limits are acceptable.

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 Slight leakage appearing in a line, as if indicating a linear defect, is
(R) not acceptable.

3.5.4 Magnesium alloy castings which leak in a 50-mm diameter area more than
(R) 180 mL of gas per minute are not acceptable, but those castings that leak less may be impregnated when so specified and the method to be used is acceptable to purchaser.

3.5.4.1 Those sections of magnesium alloy castings, impregnated or not, which
(R) leak in a 50-mm 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 is acceptable to the extent of 0.1 mL of gas per minute in a 50-mm diameter area.

3.6 Marking:
(R)

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.