

**AEROSPACE
MATERIAL
SPECIFICATION**



AMS 2604G

Issued JUN 1940
Revised JUL 1994
Cancelled FEB 2004

Superseding AMS 2604F

Pressure Testing, Gaseous Media
40 psi

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of February, 2004, and has been superseded by AMS 2610 using a test pressure of 40 to 45 psi. The requirements of the latest issue of AMS 2610 using a test pressure of 40 to 45 psi shall be fulfilled whenever reference is made to the cancelled AMS 2604. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications noting that it is superseded by AMS 2610 using a test pressure of 40 to 45 psi.

Cancelled specifications are available from SAE.

SAENORM.COM : Click to view the full text of AMS 2604G

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.

Copyright © 2004 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: <http://www.sae.org>

1. SCOPE:

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

1.1 MAM 2604 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 other than those induced by the pressure itself or by fittings acceptable to purchaser.
- 3.1.2 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 Gauges: Pressure gauges shall have divisions not more than 2 psi 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 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 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 **Chemical Film:** Chemical film protective finishes on aluminum and magnesium may be applied 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).
- 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 gas pressure of 40 to 45 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 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 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 $250\text{ }^{\circ}\text{F} \pm 25$ 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 sign of leakage under pressure, which meet 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 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 not acceptable.
- 3.5.4 Magnesium alloy castings which leak in a 2-inch diameter area more than 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 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 is acceptable to the extent of 0.1 mL of gas per minute in a 2-inch diameter area.

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 the technical requirements. This report shall include the purchase order number, AMS 2604G, test pressure, part number, and quantity.

5. PREPARATION FOR DELIVERY:

5.1 Protective Treatment:

Parts which are subject to corrosion shall be given a protective treatment, 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.