



AEROSPACE MATERIAL SPECIFICATION

AMS3159™**REV. G**

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Superseding AMS3159F

Leak Test Solution
Liquid Oxygen Compatible

RATIONALE

AMS3159G stabilizes this document because this document contains mature technology that is not expected to change and thus no further revisions are anticipated.

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1. SCOPE:

1.1 Form:

This specification covers a liquid oxygen compatible gas-leak detecting compound in the form of a liquid.

1.2 Application:

This solution has been used typically in detecting leaks in liquid oxygen propulsion systems where a leak test solution (bubble fluid) is desirable, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2400 Plating, Cadmium

AMS 2825 Material Safety Data Sheets

AMS 4037 Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn, 2024 -T3 Flat Sheet, - T351 Plate, Solution Heat Treated

AMS 4375 Magnesium Alloy, Sheet and Plate, 3.0Al - 1.0Zn - 0.20Mn (AZ31 B-O), Annealed and Recrystallized

AMS 4500 Copper Sheet, Strip, and Plate, Soft Annealed

AMS 5040 Steel, Sheet and Strip, 0.15 Carbon maximum, Deep Forming Grade

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 1173 Foaming Properties of Surface-Active Agents

ASTM D 1331 Surface and Interfacial Tension of Solutions of Surface-Active Agents

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-P-116 Preservation, Methods of

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Composition of the solution is optional with the manufacturer. It shall not contain oils, fats, or other materials capable of reacting with gaseous or liquid oxygen.

3.1.1 Leak Detecting Properties: This solution shall detect various sizes of leaks by a readily visible formation of foam or bubbles at the location of the leak when used on surfaces within the temperature range 35 to 160 °F (2 to 71 °C).

3.1.2 Appearance: The solution shall be essentially colorless. A light yellow color is acceptable provided the color is no deeper than a 0.2% aqueous solution of potassium chromate (K_2CrO_4).

3.1.3 Odor: The solution shall not have an objectionable odor.

3.1.4 Toxicity: The solution shall be free from vapors that are harmful or discomforting to personnel and shall not cause skin irritation.

3.1.5 Flammability: The solution and its evaporation residue shall be noncombustible.

3.1.6 Fungus Growth: The solution shall not support fungus growth within the container during use or (R) storage.

3.2 Properties:

Solution shall conform to the following requirements:

3.2.1 Turbidity: A freshly agitated solution shall be free of sediment and suspended matter when examined with transmitted light.

3.2.2 Evaporation Residue: The solution residue shall be not greater than 1.00% of the solution by weight when evaporated to dryness at a temperature not higher than 212 °F (100 °C) and dried to constant weight at a temperature not higher than 230 °F (110 °C).

3.2.3 Foaming Ability: Solution shall meet either the requirements of 3.2.3.1 or 3.2.3.2; in case of dispute, results of the test of 3.2.3.1 shall govern.

3.2.3.1 The solution shall exhibit an initial foam height of not less than 200 mm and a foam height of 200 mm or more after standing for 5 minutes $\pm$ 0.5, determined in accordance with ASTM D 1173 except that the temperature shall be 68 to 86 °F (20 to 30 °C).