Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 2615A
Superseding AMS 2615

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PRESSURE TESTING, HYDRAULIC
Pressure As Specified

1. SCOPE:

1.1 Application: This specification provides requirements and procedures for hydraulic-pressure leak testing of parts.

Ø 1.2 Classification: The following classes of tests establish the allowable leakage as follows:

Class A - No leakage permitted.
Class B - 2 cm^3/min.
Class C - 2 cm^3/min. for any area bounded by a 1-in. (25-mm) diameter circle
Class D - Very slow leak allowing the surface to become slightly moist or damp.
Class E - A specified leakage rate agreed upon by purchaser and vendor.

1.2.1 If no class is specified, Class E shall apply.

2. APPLICABLE DOCUMENTS: None.

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 Ø parts.

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

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

3.1.4 Gauges: Pressure gauges shall have sufficient dial divisions to permit monitoring of pressure spe- Ø cified.

Ø 3.1.5 Drying Oven: A circulating-air oven is required for drying corrodible parts.

Ø 3.2 Test Media: Either water, hydraulic fluids, or suitable petroleum-base test fluids shall be used.

3.3 Preparation:

3.3.1 Cleaning: The part shall be thoroughly cleaned and dried before testing, so that any leaks will be Ø 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, straighten- Ø ing, 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.

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3.3.3 Chemical Films: Chemical film protective finishes on aluminum 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. Impregnants shall not be used to correct poor foundry techniques, visible holes, or excessive porosity. Impregnation shall be conducted after all 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.

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: Parts shall be fitted up for test, surfaces opposite those under pressure shall be dried, and part or passage shall be filled with water or other suitable liquid. After all air has been expelled from internal passages under test, the pressure specified by the purchaser shall be applied to the liquid and maintained for sufficient time to establish the rate of leakage.

3.4.1 Duration: Parts, other than castings, shall be held under pressure for not less than 3 min. to permit complete visual inspection while at the specified pressure. Unless a specific time is specified, castings also shall be held for not less than 3 min. at the specified pressure.

3.4.2 Entrapped Air: Care shall be exercised that no air or other gas is trapped in the part being tested or any of the feeder lines associated with the testing fixture. Bleeders shall be provided to release entrapped air or gas so the entire part volume is filled with liquid.

3.4.3 Cleaning: Parts which have been tested with water or hydraulic fluid 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° F ± 25 (121.1° C ± 14) for at least one hour.

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

3.5 Acceptance Standards:

3.5.1 Leakage: Parts while under pressure shall not leak in excess of the specified requirements.

3.5.2 Distortion: Parts that show no indication of having been weakened or abnormally distorted and which do not leak under pressure beyond the leakage limits specified shall be considered acceptable.

3.5.3 Rubber Hose: Rubber or synthetic rubber hose without reinforcing braid may distort up to 15% enlargement of diameter during the test provided the hose returns to within 2% of its original diameter at all places along the entire length when the pressure is released.

3.5.4 Braided Rubber Hose: Parts may show a slight extrusion through the braid during test but, when pressure is released, the hose shall show no extension outside the braid beyond that which existed before test. Braid shall fit as snugly after test as before test.

3.5.5 Metal Tubing: Tubes shall not have a permanent set of more than 1.0% increase in diameter at any place along the entire length.