# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

**AMS 2414**

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Revised

## LEAD PLATING

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION:

2.1 To prevent galling of metal parts.

2.2 To improve the performance of bearings.

3. PREPARATION:

3.1 All brazing or welding shall be completed before parts or assemblies are plated.

3.2 Before placing parts in plating solution, they shall have chemically clean surfaces prepared with minimum abrasion, erosion, or pitting.

4. PROCEDURE:

4.1 Consists of electrodeposition of lead from a suitable lead solution directly on the basis metal except that in the case of parts made of corrosion resistant steels, high speed steels, and aluminum alloys, a suitable strike plate may be used for bonding purposes. Either lead sulfamate or lead fluoborate solution may be used but purchaser shall approve which solution to use for each part involved.

4.2 After plating, the parts shall be well washed in running water to remove adhering plating solution. They shall then be dipped in hot water, dried, and dipped in oil or otherwise protected against corrosion.

5. THICKNESS:

5.1 AMS 2414 shall designate plate thickness of 0.0005-0.0007 in.

5.2 Other plate thicknesses may be specified by this specification number and a suffix number designating the minimum thickness in ten thousandths of an inch; thus AMS 2414-1 designates a thickness of 0.0001-0.0003 in., AMS 2414-6 designates a thickness of 0.0006-0.0008 in. A tolerance of +0.0002 in. in thickness is allowed, unless otherwise specified.

5.3 Where "lead flash" is specified, the thickness of lead shall be approximately 0.0001 in.

5.4 If internal surfaces or surfaces of small holes and deep recesses are required to be plated, notes on drawings will so specify, but minimum plate thickness requirements will be waived except when such surfaces can be touched by a sphere 0.75 in. in diameter. When plating of such surfaces is specified, external surfaces may have plate thickness greater than that specified, but this will not be cause for rejection if dimensions of parts are within specified tolerances.

6. THICKNESS DETERMINATIONS: Shall be made on representative parts or on separate specimens representing parts and plated simultaneously with them, by one of the following methods, as applicable:

6.1 Microscopic Method: The specimen shall be sectioned, then mounted or held in a clamp so that the surface to be examined is perpendicular to the flat face to be ground and polished. (A deviation of 10 degrees from normal introduces an error of about 2% in thickness.) The thickness may be measured with a microscope that has been calibrated to determine the value of the unit scale dimensions.

6.2 Magnetic Method: The magnetic method may be used when agreed upon by the purchaser and vendor for the determination of thickness of lead plate.

6.3 Dropping Test Method: Allow an aqueous solution of glacial acetic acid and hydrogen peroxide to drop at a uniform rate of 100 ± 5 drops per minute directly upon properly cleaned surfaces of plated parts until the basis metal or underlying strike is exposed. This aqueous solution shall consist of 3.5% (by volume) of glacial acetic acid and a suitable percentage (by volume) of 30% (by weight) of hydrogen peroxide as shown in Figure 1. The dropping apparatus may be a 250 ml laboratory separatory funnel equipped with a stopcock to regulate the solution flow and having the discharge orifice of the outlet tube constricted to deliver drops approximately 0.05 ml each. Plated parts shall be supported so that the surface to be tested is at an angle of 45 degrees from the horizontal and about 7/8 in. below the discharge orifice. Plate which meets specified thickness requirements shall not be perforated in less than the minimum times shown in Figure 1. A fresh solution of the glacial acetic acid and hydrogen peroxide should be prepared daily unless the solution is analyzed just before use to determine that the hydrogen peroxide content has not changed with age.

7. QUALITY: Plated lead shall be adequately bonded to the underlying metal, and when it is to be used as bearing surfaces, shall be smooth, continuous and free from blisters and other harmful defects. Slight staining or discoloration will not be cause for rejection.

8. REJECTION: Parts on which plating does not conform to this specification or to authorized modifications will be subject to rejection. Unless otherwise stipulated, rejected parts will be returned to vendor at vendor's expense, unless purchaser receives, within three weeks of notification of rejection, other instructions for disposition.