



AEROSPACE MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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AMS 2414B

Superseding AMS 2414A

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LEAD PLATING

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** To prevent galling of metal parts and to improve the performance of bearings.
3. **PREPARATION:**
 - 3.1 All brazing and welding shall be completed before parts or assemblies are plated.
 - 3.2 Before placing parts in plating solutions, they shall have chemically clean surfaces prepared with minimum abrasion, erosion, or pitting.
4. **PROCEDURE:**
 - 4.1 The plating process 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 inch.
 - 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 inch. 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 inch.
 - 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 deg 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.

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- 6.2 Magnetic Method: The magnetic method may be used when agreed upon by purchaser and vendor.
- 6.3 Dropping Test Method: Allow an aqueous solution of glacial acetic acid and hydrogen peroxide to drop at a uniform rate of 100 drops \pm 5 per min. 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) glacial acetic acid and a suitable percentage (by volume) of 30% (by weight) hydrogen peroxide as shown in Fig. 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 deg 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 Fig. 1. A fresh solution of 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 a bearing surface shall be smooth, continuous, and free from blisters and other harmful imperfections. Slight staining or discoloration will not be cause for rejection.
8. APPROVAL:
- 8.1 To assure adequate performance characteristics, plated parts shall be approved by purchaser before parts for production use are supplied, unless such approval be waived.
- 8.2 Vendor shall use manufacturing procedures, processes, and methods of inspection on production parts to determine conformance to this specification which are essentially the same as those used on the approved sample parts. If any change in type of equipment or in established composition limits and operating conditions of process solutions is necessary, vendor shall submit samples for reapproval of the process unless purchaser grants written approval of the revised process after a review of a detailed statement of operations performed on the approved samples and those proposed for use. No production parts plated by the revised procedure shall be shipped prior to receipt of approval of such procedure.
9. REJECTION: Parts on which plating does not conform to this specification or to authorized modifications will be subject to rejection.