AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS2402B

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ZINC PLATING

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

2. PURPOSE: To protect metal parts against corrosion.

3. PREPARATION: (a) Before placing parts in plating solution, they shall have chemically clean surfaces, prepared with minimum abrasion erosion, or pitting.

(b) Parts having hardnesses of Rockwell C 33 and over and parts roll threaded after heat treatment, shall not be cleaned with inorganic acids (hydrochloric or sulphuric) unless specifically approved; cleaning of other parts with inorganic acids is not prohibited but permission to use that method on a particular part shall first be obtained from the purchaser. A momentary dip in acid after alkaline cleaning is permissible.

ϕ (c) Case hardened and ground parts shall be stress-relieved at 275°F minimum before cleaning.

4. PROCEDURE: (a) Consists of an electrodeposition of zinc from a zinc cyanide solution directly on the metal part without a flash coating of other metals, such as copper or nickel, underneath.

(b) Unless otherwise specified, zinc plated parts, after the final rinse from the plating operation, shall be treated by a process which will prevent the formation of white corrosion products when the plated parts are subjected for 100 hours to salt spray in accordance with the procedure referred to in paragraph 7(b) below.

ϕ (c) After plating, washing and drying, parts shall be treated as follows, unless otherwise permitted, to remove hydrogen embrittlement due to cleaning and plating.

(1) Parts, including roll threaded parts, cold worked after being heat treated to a hardness over Rockwell C 27 shall be heated to 375 ± 10°F in air, preferably in a circulating air furnace, and held at temperature for 3 hours minimum.

(2) Springs and all other parts having hardnesses of Rockwell C 33 and over shall be heated to 375 ± 10°F in air, preferably in a circulating air furnace, and held at temperature for 3 hours minimum.

(3) Parts, including carburized parts, which will decrease in hardness if heated to 375°F shall be heated to 275 ± 10°F in air, preferably in a circulating air furnace, and held at temperature for 5 hours minimum, excepting parts requiring special handling which shall be treated as agreed between purchaser and vendor.

5. THICKNESS: (a) AMS 2402 shall designate plate thickness of 0.0005 - 0.0007 inch, except on surfaces of externally threaded sections of parts, on which the plate thickness shall be capable of withstanding not less than 100 hours salt spray.

(b) 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 2402-1 designates a thickness of 0.0001 - 0.0003 inch, AMS 2402-6 designates a thickness of 0.0006 - 0.0008 inch, etc. A tolerance of +0.0002 inch in thickness of plate is allowed, unless otherwise specified.

(1) When AMS 2402-1 is specified for externally threaded parts, the plate thickness on the roots of threads shall be not less than 0.0001 inch but the plate thickness on the other surfaces of such parts shall be 0.0002 inch minimum.

(2) When AMS 2402 with any suffix number other than "-1" is specified for externally threaded parts, the minimum plate thickness shall apply to all surfaces of such parts, except those of the threads on which the plate thickness at the roots may be 0.0001 inch less than that required by the suffix number specified.

(3) AMS 2402-1, 2402-2, 2402-3, or 2402-4 shall not be specified except for parts the dimensional tolerances of which will not permit plate thickness of 0.0005 inch; for such parts the thickest plate permitted by the tolerances shall be specified.

(c) No requirements are established for thickness of plate in holes, recesses, and other areas where a controlled deposit cannot be obtained under normal plating conditions, and, except as specified above for externally threaded sections, the resulting thickness shall be considered only when such surfaces of parts can be touced by a sphere 0.75 inch in diameter.

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. (Plate thickness on externally threaded parts shall be determined by measurements made on unthreaded areas.)

(a) Thicknesses may be determined by micrometer measurement on steel strip specimens approximately 1/32 x 1 x 4 inches in the case of still plating, or on cylindrical specimens with cross-sectional areas approximately equal to those of the parts in the case of barrel plating, which are processed simultaneously with the parts through the complete cleaning and plating cycle.

(b) When possible, the thickness shall be determined on representative plated parts, using the magnetic method unless other methods have been approved.

7. QUALITY: (a) Plated zinc shall be smooth, continuous, adherent, uniform in appearance, not coarsely crystalline, and shall be free from pin holes, porosity, blisters, nodules, pits, and other harmful defects. Slight staining or discoloration will not be cause for rejection.