

# **AERONAUTICAL MATERIAL SPECIFICATION**

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

AMS 2403

Issued 11-1-48

## NICKEL PLATING

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for moderate corrosion and oxidation resistance.
3. TECHNICAL REQUIREMENTS:
  - 3.1 Surfaces of parts to be plated shall be smooth and substantially free from blemishes, pits, tool marks, and other irregularities.
  - 3.2 Unless otherwise specified, parts having hardness higher than Rockwell C 40 and which have been ground after heat treatment shall be suitably stress-relieved before cleaning for plating. Temperatures to which parts are heated shall be such that maximum stress-relief is obtained without reducing hardness of parts below drawing limits.
  - 3.3 Before placing parts in plating solutions, they shall have chemically clean surfaces, prepared with minimum abrasion, erosion, and pitting.
  - 3.4 Tight electrical connections shall be made and maintained for satisfactory plating.
  - 3.5 Plating shall be performed by electrode position of nickel from a chloride or sulfate-chloride solution containing no organic addition agents. Unless otherwise specified, nickel shall be deposited directly on the basis metal without a prior flash coating of other metal, except in the case of parts made of aluminum or aluminum alloys. A preliminary chemical coating, immersion plate and/or metal flash is permissible on aluminum and aluminum alloys.
  - 3.6 After plating, washing and drying, steel parts shall be treated as follows, unless otherwise permitted, to remove hydrogen embrittlement due to cleaning and plating.
    - 3.6.1 Parts, including roll threaded parts, cold worked after being heat treated, shall be heated to  $375\text{ F} \pm 10$  in air, preferably in a circulating air furnace, and held at temperature for not less than 3 hours.
    - 3.6.2 Parts having hardness of Rockwell C 33 or higher, excluding parts covered by 3.6.3, shall be heated to  $375\text{ F} \pm 10$  in air, preferably in a circulating air furnace, and held at temperature for not less than 3 hours.
    - 3.6.3 Parts, including carburized parts, which will decrease in hardness if heated to  $375\text{ F}$  shall be heated to  $275\text{ F} \pm 10$  in air, preferably in a circulating air furnace, and held at temperature for not less than 5 hours, excepting parts requiring special handling which shall be treated as agreed upon by purchaser and vendor.
  - 3.7 The finished thickness of plate shall be as specified on the drawing.

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