

AEROSPACE MATERIAL SPECIFICATION

SAE

AMS 1420A

Issued 1 APR 1982
Revised 1 APR 1991

Submitted for recognition as an American National Standard

COATING REMOVAL PROCESS Aluminum Alloy Coated Cobalt Alloys

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 26 September 1989. It is recommended, therefore, that this specification not be specified for new designs.

This cover sheet should be attached to the original issue of the subject specification.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, SAE, however, does not recommend this process for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE upon request.

REAFFIRMED

MAY '95

This specification is under the jurisdiction of AMS Committee "J" AMCM.

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.



The Engineering
Resource For
Advancing Mobility

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 1420

Issued
Revised

4-1-82

COATING REMOVAL PROCESS Aluminum Alloy Coated Cobalt Alloys

1. SCOPE:

1.1 Purpose: This specification covers a process for removal of aluminide protective coatings from cobalt alloys.

1.2 Application: Primarily to prepare engine-operated parts for refurbishment and recoating.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.2.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Surface Preparation:

3.1.1 Degrease: Residual oils and entrained soils shall be removed by suspending parts for approximately 30 sec, or until parts reach temperature equilibrium, in a suitable vapor degreasing atmosphere followed by spraying with distilled degreasing fluid until visually clean.

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

3.1.2 Mask: Surfaces not to be stripped shall be protected from the effects of subsequent abrasive blasting and chemical treatment by covering with plastic-film-backed adhesive tape or by coating with a suitable electroplater's lacquer or wax.

3.1.3 Abrasive Blast: Surface oxides shall be removed and the exposed areas activated for subsequent chemical treatment by grit blasting to a uniform matte gray appearance. Grit blast medium shall be a clean, dry, premium-quality grade of aluminum oxide abrasive utilized as follows:

Grit Size: U.S. Standard Sieve No. 240 (60 μm) or No. 320 (44 μm)

Blast Pressure: 30 psi (310 kPa) max (pressure type apparatus)
75 psi (620 kPa) max (suction type apparatus)

Nozzle-to-Work
Distance: 6 in. (1.50 mm), min

Dwell Time: 20 sec, max

3.1.3.1 CAUTION: Avoid blasting masked areas.

3.2 Stripping Procedure:

3.2.1 Immerse in an aqueous solution of 15 - 20% by volume technical grade 42° Baume' nitric acid for 60 min. $\pm$ 5 at 25° - 50°C (75° - 120°F) with vigorous agitation to prevent pitting.

3.2.2 Rinse thoroughly in clean water.

3.2.3 Pressure spray air-water rinse.

3.2.4 Wet abrasive blast with No. 320 (44 μm) Novaculite (See 8.2) or equivalent as necessary for removal of smut residues.

3.2.4.1 CAUTION: Avoid blasting masked areas.

3.2.5 Rinse thoroughly in clean water.

3.2.6 Pressure spray air-water rinse.

3.2.7 Immerse for 5 min. $\pm$ 0.5 in acid solution as in 3.2.1.

3.2.8 Pressure spray air-water rinse.

3.2.9 Visually inspect for complete coating removal.

3.2.9.1 A uniform matte light gray appearance of the chemically treated surface signifies complete coating removal. Proceed to 3.2.12.

- 3.2.9.2 A non-uniform or dark gray appearance of the chemically treated surface signifies incomplete coating removal. Proceed to 3.2.10.
- 3.2.9.3 When required by purchaser, vendor shall substantiate completeness of coating removal by heat treating selected parts for 60 min. $\pm$ 5 at $580^{\circ}\text{C} \pm 15$ ($1075^{\circ}\text{F} \pm 25$) in air. Uniform blue to purple oxide film indicates absence of coating. Silver to gold mottling on discrete areas indicates incomplete coating removal. Other heat tint tests may be used when agreed upon by purchaser and vendor.
- 3.2.10 Immerse in a solution of technical grade 20° Baume' hydrochloric acid containing a suitable inhibitor and wetting agent (See 8.3) for 60 min. $\pm$ 5 at $50^{\circ} - 60^{\circ}\text{C}$ ($125^{\circ} - 140^{\circ}\text{F}$) with vigorous agitation.
- 3.2.11 Repeat 3.2.2 through 3.2.9 and, if necessary, 3.2.10 except that for repeat cycles, the acid solution of 3.2.7 shall be as in 3.2.10.
- 3.2.11.1 Total exposure to stripping solutions shall not exceed 3 hours.
- 3.2.11.2 Parts from which coating has not been completely removed during the specified treatment time shall be rejected, unless otherwise specified by purchaser.
- 3.2.12 Rinse thoroughly in clean water.
- 3.2.13 Remove protective tape masking and dislodge residual adhesive, lacquer, or wax with technical grade anhydrous acetone or perchloroethylene, or by vapor degreasing. Pumice may be used in addition to the solvents.
- 3.2.14 Rinse thoroughly in clean water, rinse in hot water not cooler than 85°C (185°F), and dry in forced air.
- 3.3 Quality: Chemically treated surfaces shall be uniform in appearance, light gray in color, and essentially free from pits and other imperfections detrimental to recoating of the parts. Standards for acceptance shall be as agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The processor of parts shall be responsible for visual examination of stripped engine parts to determine that complete coating removal has been achieved. Purchaser reserves the right to perform any confirmatory testing deemed necessary to ensure that the coating has been entirely removed.
- 4.2 Classification of Tests: