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400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 1420

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Revised

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.

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. ± 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. ± 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. ± 5 at 580°C ± 15 (1075°F ± 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. ± 5 at 50° - 60°C (125° - 140°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:

4.2.1 Acceptance Tests: Tests to determine that aluminum alloy coating has been removed, based upon visual appearance, are classified as acceptance tests and shall be performed on all treated parts. In case of dispute, purchaser may require additional testing as in 3.2.9.3.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be conducted on the initial shipment of parts for coating removal, when a change in material and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test parts shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows; a lot shall be all parts of the same part number processed in a continuous operation under the same fixed conditions and presented for processor's inspection at one time:

4.3.1 For Acceptance Tests: All processed parts.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample treated parts shall be approved by purchaser before treated parts for engine use are supplied, unless such approval be waived by purchaser. Results of tests on parts treated for engine use shall be essentially equivalent to those on the approved samples.

4.4.2 Vendor shall use materials, manufacturing procedures, processes, and methods of inspection on parts treated for engine use which are essentially the same as those used on approved sample parts. If necessary to make any change in type of equipment for processing or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample treated parts. Parts for engine use shall not be treated by the revised procedure prior to receipt of reapproval.

4.5 Reports: The processing vendor shall furnish with each shipment three copies of a report stating that the parts have been processed and tested in accordance with the requirements of this specification and that the parts conform to the acceptance test requirements. This report shall include the purchase order number, AMS 1420, vendor's identification, lot number, part number, and quantity.