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Superseding ARP1755A

**Effect of Cleaning Agents on Aircraft Engine Materials
Stock Loss Test Method**

1. SCOPE:

- 1.1 This SAE Aerospace Recommended Practice (ARP) covers the determination of the amount of stock loss caused by use of chemical cleaning agents on aircraft turbine engine materials.
- 1.2 The evaluation is conducted on representative engine materials by determination of weight loss during total immersion in the cleaning solution with the weight-loss measurement converted to stock loss by calculation.
- 1.3 Test conditions are based upon manufacturer's recommended operating parameters for maximum concentration, maximum temperature, and twice the maximum immersion time.
- 1.4 Chemical cleaning solutions and compounds used for preinspection cleaning of aircraft turbine engine parts shall be subject to requirements of this test practice.
- 1.5 The test does not give consideration to cleaning performance of the compounds except as specified in 5.1.4.
- 1.6 Classification:

Examples of types of cleaning materials to be qualified under the requirements of this test procedure are:

- a. Category 1: Cold carbon and paint remover
- b. Category 2: Alkaline rust remover
- c. Category 3: Alkaline oxide conditioner
- d. Category 4: Acidic oxide conditioner
- e. Category 5: Alkaline permanganate oxide conditioner
- f. Category 6: Inhibited phosphoric acid
- g. Category 7: Hot carbon and paint remover
- h. Category 8: Silicone rubber remover
- i. Category 9: Antigalling compound remover

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1.6 (Continued):

- j. Category 10: Aqueous cleaner
- k. Category 11: Alkaline degreaser
- l. Category 12: Organic solvent cleaner

1.7 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this aerospace recommended practice may involve the use of hazardous materials, this aerospace recommended practice does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.8 Significance:

This aerospace recommended practice establishes a test procedure for determining the metal removal characteristics of aircraft turbine engine cleaning materials when used on a representative list of aircraft turbine engine alloys and coatings. This test result shall be compared with the following maximum stock loss per surface to establish acceptability for overhaul shop evaluation of cleaning performance characteristics:

- a. Bare Panels or Disks: 0.000025 in (0.635 μm)
- b. Electroplated Panels: 0.000025 in (0.635 μm)
- c. Plasma Coated Panels or Bars: 0.000100 in (2.5 μm)

2. APPLICABLE DOCUMENTS:

The following publications form a part of this aerospace recommended practice to the extent specified herein. The latest issue of SAE publications shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2400	Cadmium Plating
AMS 2406	Chromium Plating, Hard Deposit
AMS 2410	Silver Plating, Nickel Strike, High Bake
AMS 2416	Nickel-Cadmium Plating, Diffused
AMS 2418	Copper Plating
AMS 2424	Nickel Plating, Low-Stressed Deposit
AMS 2437	Coating, Plasma Spray Deposition
AMS 2470	Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS 3065	Compound, Corrosion Preventive, Thin Film, Fingerprint Removing
AMS 4037	Aluminum Alloy Sheet and Plate, 4.4Cu-1.5Mg-0.60Mn (2024; -T3 Flat Sheet, -T351 Plate)

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2.1 (Continued):

AMS 4375	Magnesium Alloy Sheet and Plate, 3.0Al-1.0Zn (AZ31B-O)
AMS 4442	Magnesium Alloy Castings, 3.3Ce-2.5Zn-0.70Zr (EZ33A-T5)
AMS 4507	Brass Sheet, Strip, and Plate, 70Cu-30Zn (CDA26000), Half Hard
AMS 4544	Alloy Sheet, Strip, and Plate, Corrosion Resistant, 67Ni-30Cu, Annealed
AMS 4640	Aluminum Bronze Bars, Rods, Forgings, and Tubing, 81.5Cu-10.3Al-5.0Ni-2.8Fe
AMS 4911	Titanium Alloy Sheet, Strip, and Plate, 6Al-4V, Annealed
AMS 4928	Titanium Alloy Bars, Forgings, and Rings, 6Al-4V, Annealed 120,000 psi (825 MPa) Yield Strength
AMS 5040	Steel Sheet and Strip, 0.15 max Carbon, Deep Forming Grade
AMS 5382	Alloy Castings, Investment, Corrosion and Heat Resistant, 54Co-25.5Cr-10.5Ni-7.5W
AMS 5504	Steel Sheet, Strip, and Plate, Corrosion and Moderate Heat Resistant, 12.5Cr (SAE 51410)
AMS 5508	Steel Sheet, Strip, and Plate, Corrosion and Moderate Heat Resistant, 13Cr-2.0Ni-3.0W
AMS 5524	Steel Sheet, Strip, and Plate, Corrosion and Heat Resistant, 18Cr-13Ni-2.5Mo (SAE 30316)
AMS 5525	Steel Sheet, Strip, and Plate, Corrosion and Heat Resistant, 15Cr-25.5Ni-1.2Mo-2.1Ti-0.006B-0.30V
AMS 5536	Alloy Sheet, Strip, and Plate, Corrosion and Heat Resistant, 47.5Ni-22Cr-1.5Co-9.0Mo-0.60W-18.5Fe
AMS 5537	Alloy Sheet, Corrosion and Heat Resistant, 52Co-20Cr-10Ni-15W
AMS 5544	Alloy Sheet, Strip, and Plate, Corrosion and Heat Resistant, 57Ni-19.5Cr-13.5Co-4.2Mo-3.0Ti-1.4Al-0.05Zr-0.006B, Consumable Electrode or Vacuum Induction Melted, Annealed
AMS 5596	Alloy Sheet, Strip, and Plate, Corrosion and Heat Resistant, 52.5Ni-19Cr-3.0Mo-5.1(Cb+Ta)-0.9Ti-0.5Al-18Fe, Consumable Electrode or Vacuum Induction Melted, 1750°F (955°C) Solution Heat Treated
AMS 5613	Steel Bars, Forgings, Tubing, and Rings, Corrosion and Moderate Heat Resistant, 12.5Cr (SAE 51410), Annealed
AMS 5661	Alloy Bars, Forgings, and Rings, Corrosion and Heat Resistant, 42.5Ni-12.5Cr-5.8Mo-2.9Ti-0.015B-35Fe, Consumable Electrode or Vacuum Induction Melted, Solution, Stabilization, and Precipitation Heat Treated
AMS 6431	Steel Bars, Forgings, and Tubing, 1.05Cr-0.55Ni-1.0Mo-0.11V (0.45-0.50C), Premium Quality, Consumable Electrode Vacuum Melted

3. MATERIALS:

Test materials shall conform to specification requirements or to composition requirements in Figure 1, as applicable. Test materials shall be obtained from commercial sources as available. When a test material is not commercially available, it may be obtained from the applicable engine manufacturer as indicated under Test Materials Sources, Figure 1.