Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 1375

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Revised

REMOVER, PAINT
Epoxy and Polyurethane Paint Systems

1. SCOPE:

1.1 Form: This specification covers an alkaline-type, thickened paint remover in the form of a liquid.

1.2 Application: Primarily for removing epoxy primer with epoxy polyamide or linear polyurethane paint topcoat from aluminum and magnesium alloys.

1.3 Precautions: Paint remover covered by this specification is toxic and contains ingredients harmful to skin and eyes. Information on necessary measures to be followed in use of this paint remover is provided in 5.1.5.

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) and Aerospace Recommended Practices (ARP) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 2400 - Cadmium Plating
AMS 2470 - Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS 2473 - Chemical Treatment for Aluminum Alloys, General Purpose Coating
AMS 2475 - Protective Treatments, Magnesium Base Alloys
AMS 4037 - Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate)
AMS 4041 - Aluminum Alloy Sheet and Plate, Alclad, 4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024 and 1-1/2% Alclad 2024-T3 Flat Sheet; 1-1/2% Alclad 2024-T351 Plate)
AMS 4045 - Aluminum Alloy Sheet and Plate, 5.6Zn - 2.5Mg - 1.6Cu - 0.26Cr (7075; -T6 Sheet, -T651 Plate)
AMS 4049 - Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.26Cr (Alclad 7075; -T6 Sheet, -T651 Plate)
AMS 4377 - Magnesium Alloy Sheet and Plate, 3.0Al - 1.0Zn (AZ31B-H24)
AMS 4911 - Titanium Alloy Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS 5047 - Steel Sheet and Strip, Low Carbon, Aluminum Killed, Forming
AMS 6350 - Steel Sheet, Strip, and Plate, 0.95Cr - 0.20Mo (0.28 - 0.33C) (SAE 4130)

2.1.2 Aerospace Recommended Practices:

ARP 1511 - Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals
ARP 1512 - Corrosion of Aluminum Alloys by Aircraft Maintenance Chemicals, Sandwich Test
ARP 1525 - Hydrogen Embrittlement Effect on Metals by Aircraft Maintenance Chemicals, Mechanical Methods

Printed in U.S.A.

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D2667 - Biodegradability of Alkylbenzene Sulfonates
ASTM F483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 except as specified in 2.3.6.

2.3.1 Federal Specifications:

O-A-451 - Ammonium Hydroxide, Technical
VV-W-95 - Wax, Paraffin, Technical
PPP-D-729 - Drum, Shipping and Storage, Steel, 55 Gallon Type I or II
PPP-P-704 - Pail, Shipping Steel (1 to 12 Gallons)
PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking of

2.3.2 Federal Standards:

Federal Test Method Standard No. 141 - Paint, Varnish, Lacquer, and Related Materials, Methods of Inspection, Sampling, and Testing
FED-STD-595 - Color (Requirements for Individual Color Chips)

2.3.3 Military Specifications:

MIL-C-5541 - Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-D-6998 - Dichloromethane, Technical
MIL-A-9962 - Abrasive Mats, Non-Woven, Non-Metallic
MIL-C-22750 - Coating, Epoxy-Polyamide
MIL-P-23377 - Primer Coating, Epoxy-Polyamide, Chemical and Solvent Resistant
MIL-T-23397 - Tape, Pressure-Sensitive Adhesive, for Masking During Paint Stripping Operations
MIL-C-81706 - Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-C-83286 - Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

2.3.4 Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

2.3.5 USAF ANA Standards:

AN 315 - Nut, Plain, Airframe
AN 509 - Screw,
AN 960 - Washer, Flat

2.3.6 U. S. Department of Labor. Occupational Safety and Health Administration Forms: Available from regional offices of U. S. Department of Labor, Bureau of Labor Standards.

OSHA Form 20 - Material Safety Data Sheet

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall be a thixotropic paint remover consisting of organic solvents, evaporation retarders, wetting agents, and other ingredients to provide a product meeting the requirements of 3.2.

3.2 Properties: The paint remover shall conform to the following requirements; tests shall be performed in accordance with specified test methods on the product supplied:

3.2.1 Toxicity: The product shall be free from chemicals and solvents in the compounded mixture which may prove dangerously corrosive or may produce vapors in such concentration as to become a medical hazard to personnel when used for its intended purpose in accordance with manufacturer's recommendations.

3.2.2 Biodegradability: Surfactants used shall be not less than 90% biodegradable, determined in accordance with ASTM D2667. The vendor of the paint remover shall furnish certification from the surfactant manufacturer of the percent biodegradability of the surfactants.

3.2.3 Consistency: The paint remover shall flow to a point between 180 and 230 mm in 5 min., determined in accordance with 4.5.1. The remover shall be of such consistency that a smooth, even coating can be applied by brushing, flowing, or spraying onto, and will adhere to, the vertical surface of test panels and painted surfaces of aircraft for sufficient time for the paint remover to be effective.

3.2.4 Flammability: The paint remover shall not continue to burn longer than 3 sec after removal of the flame, determined in accordance with 4.5.2.

3.2.5 Effect on Metallic Surfaces:

3.2.5.1 Sandwich Corrosion: Specimens, after test, shall show a rating not worse than 1, determined in accordance with ARP 1512.

3.2.5.2 Total Immersion Corrosion: The product shall neither show evidence of pitting of the panels nor cause a weight change of any single panel greater than the following, determined in accordance with ASTM F483:

Test Panel	Weight Change mg/cm^2/24 hr
AMS 4037 Aluminum Alloy, anodized as in AMS 2470	0.4
AMS 4041 Aluminum Alloy	0.4
AMS 4045 Aluminum Alloy, anodized as in AMS 2470	0.4
AMS 4049 Aluminum Alloy	0.4
AMS 4377 Magnesium Alloy, dichromate treated as in AMS 2475	0.8
AMS 4911 Titanium Alloy	0.1
AMS 5047 Carbon Steel, polished to a surface finish of 65 micro in. (1.7 µm) or better	1.0

3.2.5.3 Low-Embrittling Cadmium Plate: Panels coated with low-embrittling cadmium plate shall not show a weight change greater than 0.4 mg/cm^2/24 hr, determined in accordance with ARP 1511.

3.2.5.4 Hydrogen Embrittlement: The paint remover shall be nonembrittling, determined in accordance with ARP 1525.

3.2.5.5 Dissimilar Metal Corrosion: There shall be no significant discoloration or evidence of corrosion, determined in accordance with 4.5.3. Slight discoloration of cadmium plated low-alloy steel panels is permissible.

3.2.6 Storage Stability:

3.2.6.1 Short-Term: The paint remover shall not cake, clot, gel, or separate after being stored at room temperature, undisturbed, for 6 days in a darkened area. The product, tested for stability in accordance with 4.5.4, shall not polymerize or show significant changes in physical appearance nor exhibit evidence of adversely affecting steel surfaces. After being tested as in 4.5.4, the remover shall completely lift the finish from test panels, prepared and tested in accordance with 4.5.6, as well as, or better than, a sample of the original, unexposed paint remover.

3.2.6.2 Extended: Paint remover, stored as in 4.5.5, shall show no visible evidence of deterioration. It shall, after storage, meet all the technical requirements of this specification except that short-term storage stability need not be determined.

3.2.7 Paint Stripping Efficiency: The paint remover, tested in accordance with 4.5.6, shall remove at least 90% of the paint from the exposed surface within 10 min. at 24°C ± 2 (75°F ± 3) and within 20 min. at 10°C ± 1 (50°F ± 2).

3.2.7.1 Relative Stripping Efficiency: Shall be equal to, or better than, that of the control formula of 4.5.6, measured as the time to produce equal percentages of stripping or as the percentage of panel area stripped in equal lengths of time.

3.2.8 Rinsability: The loosened paint and spent remover shall be easily removed by water rinsing, determined in accordance with 4.5.7. If residues or noticeable water breaks occur, they shall not adversely affect the drying or adhesion of an applied paint system.

3.2.9 Refinishing Properties of Stripped Surfaces: Following stripping and wiping clean, using cloths saturated with methyl ethyl ketone or other suitable solvent, the paint remover shall leave a surface suitable for refinishing, including re-surface treatment, determined in accordance with 4.5.8.

3.2.10 Volatility: Shall be equal to, or less than, the volatility of distilled water, determined in accordance with 4.5.9.

3.2.11 Performance: The paint remover, used in accordance with the manufacturer's recommendations, shall show satisfactory performance in actual use. This service performance test shall be performed after the product has met all other technical requirements of this specification.

3.3 Quality: Paint remover shall be homogeneous, uniform in consistency, suitable for spray, brushing, or flowing application, and free from skins and lumps and from foreign materials detrimental to usage of the paint remover.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to consistency (3.2.3), flammability (3.2.4), total immersion corrosion (anodized aluminum alloys only) (3.2.5.2), low-embrittling cadmium plate (3.2.5.3), short-term storage stability (3.2.6.1), paint stripping efficiency (3.2.7), rinsability (3.2.8), and volatility (3.2.10) requirements are classified as acceptance tests.

4.2.2 Periodic Tests and Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as periodic tests and as qualification tests.

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

4.3 Sampling: Shall be in accordance with the following; a lot shall be all paint remover manufactured at the same time from the same batches of raw materials and submitted for vendor's inspection at one time. If paint remover cannot be identified by batch or tank, a lot shall consist of not more than 5,000 gal (18,925 dm^3) offered for delivery at one time.

4.3.1 Acceptance Tests:

4.3.1.1 Bulk Quantity: Samples shall be selected in accordance with Federal Test Method Standard No. 141 except that the sample shall consist of not less than one gal (3.8 dm^3) of paint remover from each lot.

4.3.1.2 Filled Containers: A random sample of filled containers shall be selected from each lot in accordance with MIL-STD-105 at Inspection Level I and Acceptable Quality Level (AQL) 2.5% defective to verify conformance to all requirements of this specification regarding fill, closure, marking, and other requirements not involving tests.

4.3.2 Periodic Tests and Qualification Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Paint remover shall be approved by purchaser before remover for production use is supplied, unless such approval be waived. Results of tests on production remover shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, and methods of routine inspection of production remover which are essentially the same as those used on the approved sample remover. If any change is necessary in ingredients or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and processing and, when requested, sample remover. Production paint remover made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods: Shall be conducted as follows; all tests shall be conducted at 24°C ± 3 (75°F ± 5) and at a relative humidity of 50% ± 5, unless otherwise specified:

4.5.1 Consistency: Shall be determined with a consistometer (Central Scientific Company Catalog No. 24925) or equivalent type instrument.

4.5.2 Flammability:

4.5.2.1 Preparation of Test Panel: One end of a clean AMS 4037 aluminum alloy panel 0.040 x 4 x 3/4 in. (1 x 100 x 20 mm), anodized in accordance with AMS 2470, shall be held at an angle of approximately 45 degrees. The paint remover shall be poured along the upper edge of the panel allowing the remover to flow freely over the surface. Remover settling on the reverse side of panel shall be wiped clean before proceeding with the test.

4.5.2.2 Procedure: A micro-burner flame, 1/8 - 3/16 in. (3.2 - 4.8 mm) in height shall be passed, within a 2-sec period, back and forth along the lower edge of the panel. This operation shall be repeated three times at 3-sec intervals. If the remover ignites, the burner flame shall be removed and observation made to ascertain whether the remover continues to burn. The above procedure shall be repeated on another similarly prepared panel except that it shall be placed in an oven for 15 min. ± 1 at 45°C ± 2 (113°F ± 4). The panel shall then be removed from the oven and subjected to the flame test.

4.5.3 Dissimilar Metal Corrosion:

4.5.3.1 Preparation of Test Panels: Ten test panels, each 4 x 3 in. (100 x 75 mm), shall be prepared from the following metals; panels shall be of any convenient thickness (3/16 in. (4 mm) is suggested) except that the aluminum alloy panels shall have nominal thickness of 0.125 in. (3.18 mm).

Test Panel Material	Number of Panels
AMS 4049 Aluminum Alloy	3
AMS 4377 Magnesium Alloy, dichromate treated as in AMS 2475	2
AMS 4911 Titanium Alloy	3
AMS 6350 Low-Alloy Steel, cadmium plated as in AMS 2400-5	2

4.5.3.1.1 The three aluminum alloy, one steel, and one magnesium alloy test panels shall have holes drilled as shown in Fig. 1. One magnesium alloy, one steel, and the three titanium alloy test panels shall have holes located as specified in Note 3 of Fig. 1. The test panels shall be cleaned by immersion for not less than 60 sec in boiling, Reagent Grade, isopropanol, rinsed several times in methyl ethyl ketone, and dried. Dissimilar metal couples as follows shall be assembled as in Fig 2, using a shim of polyethylene 0.010 in. (0.25 mm) in nominal thickness under one corner, with cadmium plated steel screws, nuts, and washers turned finger-tight; in forming the couples, care shall be exercised to avoid making fingerprints on the test panels:

Aluminum Alloy to Magnesium Alloy
Aluminum Alloy to Cadmium Plated Steel
Aluminum Alloy to Titanium Alloy
Titanium Alloy to Cadmium Plated Steel
Titanium Alloy to Magnesium Alloy

4.5.3.2 Procedure: Immerse the coupled panels completely in the paint remover for 60 min. ± 5. Remove the couples and place them in an oven, maintained at 38°C ± 1 (100°F ± 2), for not less than 48 hours. Remove the panels from the oven and immediately suspend them in a clean desiccator having the lower portion filled with distilled water; close the desiccator and maintain it at 25°C ± 1 (77°F ± 2), keeping it tightly sealed. After the 48 hr, remove the couples from the desiccator, disassemble them, wash each panel with water, and clean with acetone. Examine each panel for pitting, etching, and corrosion products.

4.5.4 Short-Term Storage Stability:

4.5.4.1 Preparation of Test Sample: A 5 oz (150 mL) portion of well mixed paint remover shall be poured into each of two chemically clean 12 oz (350 mL) pressure-resistant, clear, glass bottles and carefully capped. The bottles shall be approximately 9-1/2 in. (250 mm) in height, with shoulders 2-1/2 in. (65 mm) in outside diameter and 5 in. (125 mm) from the base.

4.5.4.2 Procedure:

4.5.4.2.1 Cold Cycle Test: One bottle shall be stored in a darkened area for not less than 6 days. The other bottle shall be placed in a water bath maintained at 54° C ± 2 (129° F ± 4) for 60 min. ± 2. The bottle in the water bath shall be carefully removed and allowed to cool at room temperature for 60 min. ± 2 and visually examined. Layer formation shall be considered unsatisfactory and further testing discontinued. If the paint remover appears homogeneous, the bottle shall be placed in a cold box maintained at -10° C ± 2 (14° F ± 4) for 60 min. ± 2, after which it shall be removed and allowed to remain undisturbed, at room temperature, for 60 min. ± 2. The paint remover shall again be examined for homogeneity. If layer formation is evident, further testing shall be discontinued. If the paint remover appears homogeneous, the contents of the bottle shall be carefully transferred (avoid splashing) to a similar, chemically-clean bottle for performing the following hot cycle test.

4.5.4.2.2 Hot Cycle Test: A strip of AMS 5047 steel, approximately 0.020 x 1/2 x 6 in. (0.5 x 13 x 150 mm), shall be polished with abrasive mat to remove surface contamination. The abrasive mat shall be a qualified product conforming to MIL-A-9962, fine or very-fine grade. The steel strip shall then be cleaned by being placed for not less than 1 min. in boiling, Reagent Grade, isopropanol and rinsed several times in methyl ethyl ketone. The steel strip shall be partially immersed in the paint remover contained in the test bottle. In subsequent operations, the bottle shall be handled carefully to avoid sloshing paint remover farther up the steel strip. The bottle shall be capped, placed in an oil bath, and heated at a uniform rate to 60° C ± 2 (140° F ± 4) within 5 hours. It shall be held at this temperature for not less than 3 hours. The above heating procedure shall be repeated each day for a total of 5 days. No heat shall be supplied to the bath overnight. This test need not necessarily be attended if an interval timer is used to operate the equipment automatically. On the morning of the sixth day, the bottle shall be removed from the bath, uncapped, and the steel strip carefully withdrawn without disturbing the paint remover. The strip shall be rinsed with tap water, dried, and the portion of the steel strip which had been immersed in the remover examined for evidence of pitting, corrosion, and uneven darkening. The part of the test strip above the paint remover shall be examined for evidence of corrosion. The paint remover shall be compared with the remover in the original bottle stored in a darkened area. Any difference in appearance, such as layer separation and evidence of polymerization, shall be noted. The opened bottle shall be recapped and the two bottles thoroughly shaken for 60 sec ± 2, allowed to remain undisturbed for 60 min. ± 2 at room temperature, and examined. Any marked variation in general appearance between the two samples shall be considered as showing unsatisfactory stability properties. If considered satisfactory, the paint remover, which had been heated as above, shall be tested for paint stripping efficiency.

4.5.5 Extended Storage Stability: One gal (3.8 dm^3) of paint remover shall be stored in a glass bottle to which have been added six 1 x 6 in. (25 x 150 mm) clean, AMS 5047 steel strips having a surface roughness of 65 microin. (1.7 µm) or better. The bottle shall be protected from light and stored for 1 year at 24° C ± 3 (75° F ± 5). After storage, the paint remover shall be subjected to all tests of this specification except the short-term stability test and the performance test.

4.5.6 Paint Stripping Efficiency:

4.5.6.1 Preparation of Test Panels: Test panels shall be made from AMS 4041 aluminum alloy and shall be nominally 0.020 x 3 x 6 in. (0.50 x 75 x 150 mm) in size. Panels double in area may be used by dividing panels into two areas with MIL-T-23397 foil masking tape. If double size panels are used, the masking tape should be sufficiently resistant to the paint remover to remain on the panels during the test. The edges of the panels shall be broken and smoothed and the panels prepared as follows:

4.5.6.1 (Continued)

Step 1 - Chemical treat in accordance with AMS 2473 or MIL-C-5541, Class 1A, using MIL-C-81706, or equivalent.

Step 2 - One coat of epoxy polyamide primer (MIL-P-23377) to a thickness of 0.6 - 0.9 mil (15 - 23 µm), dry for 2 - 4 hr at room temperature.

Step 3a - One mist coat of epoxy polyamide (MIL-C-22750, FED-STD-595 Gloss White), dry for 30 min. ± 5 at room temperature.

Step 3b - One mist coat of aliphatic isocyanate urethane (MIL-C-83286, FED-STD-595 Gloss White), dry for 30 min. ± 5 at room temperature.

Step 4a - One full coat of epoxy polyamide (MIL-C-22750, FED-STD-595 Gloss White) to a thickness of 1.2 - 1.4 mil (30 - 36 µm), dry for 4 days at room temperature, and bake for 24 hr ± 0.5 at 82°C ± 3 (180°F ± 5).

Step 4b - One full coat of aliphatic isocyanate urethane (MIL-C-83286, FED-STD-595 Gloss White) to a thickness of 1.2 - 1.4 mil (30 - 36 µm), dry for 4 days at room temperature, and bake for 24 hr ± 0.5 at 82°C ± 3 (180°F ± 5).

4.5.6.1.1 For testing material for removal of epoxy polyamide paint system, prepare panels using steps 1, 2, 3a, and 4a.

4.5.6.1.2 For testing material for removal of aliphatic isocyanate urethane paint systems, prepare panels using steps 1, 2, 3b, and 4b.

4.5.6.2 Procedure: Six panels, or 3 panels double in area, coated with each paint system specified in 4.5.6.1.1 or 4.5.6.1.2 shall be placed on a rack so that the 6-in. (150-mm) dimension forms an approximate 60 deg angle with the horizontal. The test shall be performed in a well-ventilated, draft-free room. The test sample shall be poured along the top edge of three panels to completely cover each panel area, taking 15 sec ± 1 for each wetting procedure. On the other three panel areas, a similar procedure shall be followed using freshly-prepared, well-mixed, control formula as in 4.5.6.2.1. Note the time at which application is started and time when lifting or wrinkling of the coating is completed. After 10 min. ± 0.2 exposure, the loosened film shall be brushed off and the panel rinsed, with brushing, under a stream of cool water. The above procedure shall be repeated at 10°C ± 1 (50°F ± 2) with two fresh panels, one each for the test material and the comparison control formula, and an exposure time of 20 min. ± 0.2 before rinsing. The panels and removers shall be at 10°C ± 1 (50°F ± 2) before starting the test. Times shall be recorded as above and compared for compliance with requirements of 3.2.7. Observation shall be made to determine if coating has been removed by test sample more completely than by comparison control formula. Retain panels for rinsability test of 4.5.7.

4.5.6.2.1 Paint Stripping Comparison Control Formula: Shall be prepared as follows; the comparison control formula does not conform to all requirements of this specification and is intended to be used only as a means of standardization in order that certain desired properties may be obtained:

Dichloromethane (MIL-D-6998)	120 mL
Phenol (89%) U.S.P.	70 mL
Distilled Water	10 mL
Aerosol 22 (See 4.5.6.2.1.1)	4 g
Tall Oil Fatty Acid (See 4.5.6.2.1.2)	8 g
Aerosol OT (75%) (See 4.5.6.2.1.1)	4 g
Klucel "H" (See 4.5.6.2.1.2)	2 g
Paraffin Wax (VV-W-95)	2 g
Dichloromethane (MIL-D-6998)	80 mL
Ammonium Hydroxide (O-A-451)	As Required

4.5.6.2.1 (Continued)

Mix dichloromethane, phenol, distilled water, Aerosol 22, tall oil fatty acid, and Aerosol OT in the order named with constant stirring. Add Klucel "H" very slowly with continued stirring. Melt the paraffin wax (melting point 53° - 54°C (128° - 130°F) and slowly add 80 mL dichloromethane to the melted wax. Slowly add the wax-dichloromethane mixture to the initial mixture while continuing stirring. Adjust the pH of the mixture to 8.5 by addition of 28% ammonium hydroxide diluted 1:1 with distilled water.

4.5.6.2.1.1 Aerosol 22 and Aerosol OT are products of American Cyanamid Company.

4.5.6.2.1.2 Tall oil fatty acid and Klucel "H" are products of Hercules, Incorporated.

4.5.7 Rinsability: The panels used in the test of 4.5.6 shall be recoated with paint remover and placed in a draft-free location for not less than 45 minutes. After the 45 min, any remaining paint film shall be loosened from the surface. The panels shall be rinsed with tap water for 5 min. ± 0.5 while brushing with a soft-bristle brush. Rate of flow of water shall be 4 gal (15 dm^3) per minute. The panels shall be examined for removal of the spent remover, residues, and water break. The panels shall be oven dried for 15 min. ± 1 at 70°C ± 5 (160°F ± 9), allowed to cool to room temperature, and examined for residues. Note if appreciable water break and residues occur.

4.5.7.1 Smut: After stripping the paint as specified in 4.5.6 and 4.5.7, if any residue or smut is present on the panels, the surfaces of the panels shall be wiped clean using cloths saturated with methyl ethyl ketone or other suitable solvent.

4.5.8 Refinishing Properties of Stripped Surfaces: The panels from 4.5.7.1 shall be refinished in accordance with 4.5.6.1 and the refinished surfaces examined for evidence of tackiness. A tack-free film is defined in Federal Test Method Standard No. 141, Method 4061. The adhesion of the finish shall be determined in accordance with Federal Test Method Standard No. 141, Method 6301, and compared with the adhesion of the finish on a new panel coated at the same time. The surface shall be considered acceptable if refinishing produces a tack-free film with undiminished adhesion.

4.5.9 Volatility: Bring sample and distilled water to test temperature. A Petri dish, 90 mm in diameter and 15 mm deep, shall be placed on each pan of a two-pan beam balance. Sufficient paint remover shall be added to cover the entire bottom of one of the dishes. Distilled water shall be carefully poured into the other dish until the dish containing the paint remover is counterbalanced. The balance with the Petri dishes on the pans shall be exposed for 30 min. ± 1 in a draft-free location. At the end of the exposure period, the comparative loss in weight shall be determined.

4.6 Reports: Unless waived by purchaser, the vendor of the paint remover shall furnish with each shipment three copies of a report showing the results of tests on each lot to determine conformance to the acceptance test requirements and stating that the paint remover conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number, manufacturer's identification, lot number, and quantity.

4.6.1 Reports of qualification test results shall include a completed copy of OSHA Form 20 Material Safety Data Sheet or equivalent covering product formulation. All requests for modification of formulation shall be accompanied by a similar form for the proposed formulation.

4.6.2 The vendor of the paint remover shall supply a certificate of compliance to biodegradability requirements (3.2.2).