

MIL-R-25134B(USAF)

10 March 1972

Superseding

MIL-R-25134A(USAF)

10 April 1961

MILITARY SPECIFICATION

REMOVER, PAINT AND LACQUER, SOLVENT TYPE

1. SCOPE

1.1 This specification covers one type and grade of paint remover for use on aircraft and other metal surfaces.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein.

* SPECIFICATIONS

Federal

O-A-451	Ammonium Hydroxide, Technical
QQ-A-250/1	Aluminum 1100, Plate and Sheet
QQ-A-250/4	Aluminum Alloy 2024, Plate and Sheet
QQ-M-44	Magnesium Alloy, Plate and Sheet (AZ31B)
QQ-P-416	Plating, Cadmium (Electrodeposited)
QQ-T-425	Tinplate (Hot Dip and Electrolytic)
SS-P-821	Pumice; Ground, Abrasive
TT-L-32	Lacquer, Cellulose Nitrate, Gloss, (For Aircraft Use)
TT-M-261	Methyl Ethyl Ketone, (Technical)
TT-E-485	Enamel, Semi-Gloss, Rust-Inhibiting
TT-E-489	Enamel, Alkyd, Gloss
VV-W-95	Wax, Paraffin, Technical
PPP-D-729	Drums: Metal, 55 Gallon (For Shipment of Noncorrosive Material)
PPP-P-704	Pails, Shipping, Steel (1 through 12 Gallon)

Military

MIL-A-148	Aluminum Foil
MIL-M-3171	Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion On
MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys

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MIL-D-6998	Dichloromethane, Technical
MIL-S-7952	Steel, Sheet and Strip, Uncoated, Carbon (1020 and 1025)(Aircraft Quality)
MIL-P-7962	Primer Coating, Cellulose Nitrate Modified Alkyd Type, Corrosion Inhibiting, Fast Drying (For Spray Application Over Pretreatment Coating)
MIL-C-8514	Coating Compound, Metal Pretreatment, Resin-Acid
MIL-P-8585	Primer Coating, Zinc Chromate, Low Moisture Sensitivity
MIL-L-19537	Lacquer, Acrylic-Nitrocellulose, Gloss (For Aircraft Use)

* STANDARDS

Federal

FED-STD-141	Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing
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Military

MIL-STD-129	Marking for shipment and Storage
MIL-STD-831	Test Reports, Preparation of

Air Force-Navy Aeronautical

MS35649	Nut, Plain, Hexagon, Machine Screw, Unc-2B
MS35206	Screw, Machine-Pan Head, Cross-Recessed, Carbon Steel, Cadmium Plated, UNC-2A
AN960	Washer, Flat

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

- * 2.2 Other publications. The following documents form a part of this specification. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

American Society for Testing and Materials (STM) Standards D2196 - Rheological Properties for Non-Newtonian Materials
(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.)

WADC Technical Report #58-481 Hydrogen Embrittlement of Cadmium Coated Steel
(Application for copies should be addressed to AFML/LAA, Wright-Patterson Air Force Base, Ohio)

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3. REQUIREMENTS

3.1 Qualification. The remover furnished under this specification shall be a product which has been tested, and passed the qualification tests specified herein, and has been listed or approved for listing on the applicable qualified products list.

- * 3.2 Materials. The paint remover covered by this specification shall be a paint remover consisting of organic solvents, evaporation retarders, wetting agents and other ingredients to produce a satisfactory product. The manufacturer is given wide latitude in the selection of raw materials and processes of manufacture, but shall be restricted by the requirements of this specification. The materials used shall be of high quality and entirely suitable for the purpose intended.
- * 3.2.1 Toxicity. The material shall have no adverse affect on the health of personnel when used for its intended purpose. The vendor shall submit to the government either a certified list of the ingredients of the product, identifying each ingredient by a recognizable chemical term or trade name, and the range of percentages that either exist or can be expected to exist in the finished product, or complete toxicological and associated medical or clinical data. If the vendor chooses to submit toxicological data, the government reserves the right to examine in detail, all toxicological data, including experimental methods, results and conclusions of the toxicological research agency performing such research. The government also reserves the right to consult freely with the research agency concerning the conduct and results of such research.
- * 3.2.2 Waste Disposal Characteristics. The product shall be free of abrasive or gritty material and shall contain no phenol, cresol, creosote, oil, cresylic acid, or their derivatives, benzene, carbon tetrachloride, phosphates or other compounds deemed inappropriate by the procuring activity. Surfactants used shall be a minimum of 90% biodegradable. The supplier shall furnish certification from the surfactant manufacturer of the percent activity and percent biodegradability of the surfactants. The compound shall not contain more than 2000 milligrams/liter of heavy metals.

3.3 Appearance. The remover shall be free from skins and lumps. It shall be readily mixed to a homogeneous condition and shall remain homogeneous for a period of 1 hour when tested as specified in 4.9.1.

3.4 Consistency and flow. The remover shall be a liquid of such consistency that a smooth, even coating can be applied by brush, spray, or flowing. When applied to a test panel as specified in 4.9.2, the remover shall drain so that a heavy, wet film remains over the entire test area of the panel. No evidence of shearing action or dry spotting of the film is acceptable.

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- * 3.5 Viscosity. When tested at 25° C (77°F) as specified in 4.9.3 the remover shall have a viscosity of not less than 6.0 nor more than 14.0 poises.
- * 3.6 Volatility. The volatility of the paint remover shall be equal to or less than the volatility of distilled water, when tested under the conditions specified in 4.9.4.
- * 3.7 Removal power. When tested as specified in 4.9.5, the remover shall loosen, soften and remove enamel and lacquer finishes as well as, or better than, the paint stripping efficiency control formula product.
- 3.8 Rinsibility. When tested as specified in 4.9.6, enamel and lacquer films that have been lifted by the remover shall be as completely and readily removed by flushing with a stream of water as those lifted by the comparison formula.
- 3.9 Coating residue. The remover shall leave no coating residue nor remover residue greater than that left by the comparison formula on stripped and water-rinsed metal surfaces when tested as specified in 4.9.7.
- 3.10 Remover residue. The remover shall leave no more residue than the comparison formula on bare or pretreated metal surfaces when tested as specified in 4.9.8.
- 3.11 Corrosion. The remover shall not corrode uncoated steel, cadmium plated steel, tinplate, aluminum alloy, magnesium, nor combinations thereof when tested as described in 4.9.9 through 4.9.9.3.2.
- 3.12 Hydrogen embrittlement. When tested as specified in 4.9.10, there shall be no evidence of hydrogen embrittlement of the test specimen. Failure of any specimen of the test group constitutes failure of the entire group.
- 3.13 Flammability. The remover shall not continue to burn after removal of an externally applied flame when tested as specified in 4.9.11.
- 3.14 Cold stability. When tested as specified in 4.9.12, remover that has been cooled at minus 10° C (14°F) for 4 hours then returned to room temperature shall be as readily dispersed to its original appearance and consistency as the uncooled sample. After standing 1 hour without agitation, the cooled sample shall show no more settling than the uncooled sample.

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3.15 Storage stability. After 6 months storage as specified in 4.9.13, the remover shall conform to all of the requirements of this specification except that coupled test panels (see 4.9.9.3) prepared from 1100 (2S) aluminum and from magnesium treated in accordance with MIL-M-3171, type I, shall be excluded from the corrosion tests.

- * 3.16 Service test. The remover, when tested as specified in 4.9.14 shall show satisfactory performance in actual use.
- * 3.17 Workmanship. The component ingredients shall be intimately blended and processed as required in accordance with the best commercial practice for a high quality material.

4. QUALITY ASSURANCE PROVISIONS

4.1 The supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and services acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 General inspection provisions. Except as otherwise indicated, sampling and inspection shall be in accordance with FED-STD-141, method 1031.

- * 4.3 Classification of inspection. The inspection and testing of the remover shall be classified as follows:

a. Qualification inspection: Qualification inspection consists of those tests accomplished on samples submitted for approval as a qualified product.

b. Quality conformance inspection: Quality conformance on paint remover submitted for acceptance under a contract.

4.4 Qualification inspections.

- * 4.4.1 Qualification test samples. Qualification test samples shall consist of 3 gallons of the remover packaged in 1-gallon, 24 gauge, uncoated steel containers (see 6.5). The samples shall be identified by securely attached, durable tags marked with the information listed below and forwarded to the activity responsible, Supply Officer, Robins AFB, Ga 31093, ATTN: Chief, Materials and Test Branch, Service Engineering (WRAMA/MSET), for qualification or as otherwise directed in the letter of authorization from the qualifying activity (see 6.2).

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Sample for qualification tests
 Remover, Paint and Lacquer Solvent Type
 Specification MIL-R-25134 (USAF)
 Manufacturer's Formula No.
 Manufacturer's Code No.
 Name of manufacturer
 Letter of authorization date

- * 4.4.1.1 Qualification test samples shall be accompanied by a certified test report showing that the material conforms to all requirements of this specification excluding the 6-month storage stability test. The report shall also include complete formulation data specifically identifying each ingredient of the remover by chemical or proprietary name, grade (when applicable), and the percent of each. When test samples are to be submitted to another activity for qualification inspection, the test report shall be sent to WRAMA/MEET Robins AFB, Ga 31093. Test report shall follow format outlined in MIL-STD-831.
- * 4.4.2 Service test samples. Service test samples shall consist of 100 gallons of paint remover contained in 20 five-gallon steel drums conforming to PPP-P-704, Type 1. No overpacking is required. Samples shall be forwarded in accordance with instructions contained in the authorizing letter granting service test which will be sent to the manufacturer on satisfactory completion of all laboratory tests.
- 4.4.3 Qualification tests. Qualification tests shall consist of all of the tests of this specification.
- * 4.5 Quality conformance tests. Quality conformance tests shall consist of all tests of this specification except cold stability (4.9.12), storage stability (4.9.13), hydrogen embrittlement (4.9.10), and service tests (4.9.14).
- 4.6 Test conditions. Except as otherwise specified in the particular test methods, all testing shall be conducted under standard laboratory conditions of $75^{\circ} \pm 2^{\circ}\text{F}$ and 50 ± 5 percent relative humidity.
- * 4.7 Comparison formula. The comparison formula required by this specification shall be prepared in advance according to the following formulation:

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	PERCENT BY WEIGHT
Paraffin Wax (Specification WV-W-95, Type I, Grade B, Finely Shaved)	3.0%
Methylene Chloride (Specification MIL-D-6998)	67.0%
Wetting Agent (alkyl aryl sulfonate, Santomerse I, or equal)	5.0%
Methyl Cellulose (Commercial Grade, 400 Cps)	5.0%
Tetrahydrofuran (Commercial Grade)	7.0%
Methyl Ethyl Ketone (Technical) TT-M-261	6.0%
Ammonium Hydroxide, (Technical O-A-451, Type 1)	7.0%

- * 4.7.1 A three-necked flask, fitted with stirrer, reflux condenser and dropping funnel is charged with the solids (Wax, Wetting Agent, and Methyl Cellulose). The organic solvents are then added to the solids already in the flask. While stirring, the formulation is brought to reflux for a period of one hour. Use an appropriate size heating mantle to heat the flask. At the end of the reflux period, remove the heating mantle and cool the flask to touch. Ammonium Hydroxide is then added with stirring, at a rate of 5 ml/min. Care must be taken to assure ammonium hydroxide vapors do not traverse the reflux condenser.

4.7.2 Comparison formula that is over 7 days old shall not be used.

- * 4.8 Preparation of coated test panels. Test panels shall be made from aluminum alloy sheet conforming to Specification QQ-A-250/4, T-3 condition. The panels shall measure 5 inches by 24 inches. The edges shall be broken and smoothed. Clean panels with solvent to remove any grease that is present. Panels shall be prepared as specified in Table I. After curing, apply several strips of $\frac{1}{2}$ to 1 inch wide masking tape parallel to the 5 inch edge of the panel and spaced so that six $2\frac{1}{2}$ by 5 inch areas of coated surface are exposed between the strips of tape.

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TABLE I. TEST PANEL FINISHES

LACQUER PANELS "A"

Process- ing Step	Material	No. of Coats and Thickness Per Coat	Drying Time Between Coats	Drying Time Before Baking	Baking Condi- tions
1	Coating, Pretreatment MIL-C-5541, Class 1 A				
2	Coating, Pretreatment Smooth Finish, Spray Type, MIL-C-8514	One 0.2 to 0.3 Mils	30 min at Room Temp.		
3	Lacquer Type, Primer, MIL-P-7962	one 0.3 to 0.4	1 Hr at Room Temp		
4	Lacquer MIL-L-19537 Insigna White Color No. 17875	Two 0.5 to 0.6 Mils	45 min. at Room Temp.	24 Hrs	150° F For 96 Hours

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LACQUER PANELS "B"

Processing Step	Material	No. of Coats and Thickness Per Coat	Drying Time Between Coats	Drying Time Before Baking	Baking Conditions	
1	Coating, Pretreatment MIL-C-5541, Class 1 A					
2	Coating, Pretreatment Smooth Finish, Spray Type, MIL-C-8514	One 0.2 to 0.3 Mils	30 min at Room Temp.			
3	Zinc Chromate Primer, MIL-P-8585	One 0.2 to 0.3 Mils	18 hrs At Room Temp.			
4	Lacquer Type 1 TT-L-32 Insigna White Color No. 17875	Two 0.5 to 0.6 Mils	60 min at Room Temp.	24 hrs	150°F For 96 Hrs	

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ENAMEL PANELS "C"

Process- ing — Step	Material	No. of Coats and Thickness Per Coat	Drying Time Between Coats	Drying Time Before Baking	Baking Condi- tions
1	Coating, Pretreatment MIL-C-5541 Class 1A				
2	Coating, Pretreatment, Smooth Finish Spray Type MIL-C-8514	One 0.2 to 0.3 Mils	30 min at Room Temp		
3	Zinc Chromate Primer MIL-P-8585, Control Formula	One 0.3 to 0.4 Mils	18 hrs at Room Temp		
4	Enamel TT-E-489 Class A Composi- tion L	One Mist Coat	45 min at Room Temp		
5	Enamel TT-E-489 Class A Composi- tion L	One 1.0 - 1.5 Mils		18 Hrs Room Temp	150°F For 96 Hrs

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4.9 Test Methods

4.9.1 Appearance. The remover shall be mixed by brisk hand shaking for a period of 30 seconds after which it shall be examined for skins, lumps, and homogeneity. Approximately 50 milliliters of the mixed remover shall then be poured into a 100-milliliter glass stoppered, graduated cylinder and allowed to stand for 1 hour. At the end of the 1-hour period, the remover shall be visually examined for any signs of separation.

4.9.2 Consistency and flow. An enamel-coated aluminum test panel conforming to 4.8 shall be used for this test. The panel shall be taped as specified in 4.8 to provide $2\frac{1}{2}$ -by 5-inch coated test areas. A strip of masking tape three-quarters of an inch wide shall be placed at the top of one of these test areas, and two strips shall be placed at the bottom of the same area. After taping, the panel shall be placed with its long edge horizontal and its short edge at a 45-degree angle from the horizontal. Sufficient well-mixed remover shall then be poured along the top edge of the panel to completely wet and cover the taped-in test area. Application time shall not exceed 10 seconds. The area enclosed by the tape shall be visually examined during the initial run off of excess remover then again 5 minutes and 15 minutes after the initial application. (An enamel-coated aluminum test panel prepared for the removal test of 4.9.5 may also be used for this test.)

* 4.9.3 Viscosity. A 450-milliliter sample of the remover shall be placed in a 600-milliliter beaker. Viscosity of the sample shall be determined at 25° C (77° F) using a Model LVF Brookfield Viscosimeter, or its equivalent, with a No. 3 spindle operating at 30 rpm in accordance with ASTM D2196. Readings shall be taken after the spindle has been operating for a minimum of 3 minutes.

* 4.9.4 Volatility. A Petri dish, 9 centimeters in diameter and 1.5 centimeters deep, shall be placed on each pan of a two-pan beam balance. Sufficient remover shall be added to cover the entire bottom of one of the dishes. Distilled water shall be carefully poured in the other dish until the dish containing the remover is counter balanced. The balance with the Petri dishes on the pans shall be exposed for 30 minutes in a draft-free atmosphere having a temperature of $75 \pm 5^\circ \text{F}$ ($24 \pm 3^\circ \text{C}$) and a relative humidity of 50 ± 5 percent. At the end of the exposure period, the comparative loss in weights shall be observed.

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* 4.9.5 Removal power. Place one of each of the three different test panels prepared as specified in 4.8, in a suitable container with the long edge horizontal and the short edge at a 45 degree angle to the horizontal. Pour just enough of the well mixed control formula along the top edge of the panel to completely wet one of the coated test areas, allowing the excess to drain off. Do not permit application time to exceed 10 seconds. Note the time at which application is started and the time when lifting or wrinkling of the coating is complete. Within one minute of initial application, repeat process on next panel. Continue with the process to establish optimum removal time for each type of test panel for the control formula.

Repeat the above process, alternating test areas with test remover and control formula and leaving remover on panel for the time established during the first part of the test. When established time is reached, the panels shall be rinsed in a stream of tap water. Gentle brushing with a soft bristle brush is acceptable to break lifted film. The areas tested with comparison formula and those tested with test remover shall be compared for coating and remover residue and completeness of paint removal in compliance with requirements of 3.7.

4.9.6 Rinsibility. Rinsibility shall be determined immediately after the removal test of 4.9.5 using the same test panels. After lifting of the coating is complete on the areas tested as specified in 4.9.5, a stream of tap water shall be run over each area. The areas tested with comparison formula and those tested with remover shall be compared for ease and completeness of flushing off lifted and wrinkled finish and for freedom from residue. Brushing with a soft bristle brush is acceptable to break residue film.

4.9.7 Coating residue. One panel of each paint system specified in 4.8 shall be taped according to requirements of 4.8. The procedure specified in 4.9.5 for application of the remover and comparison formula shall then be repeated and the panels permitted to stand for 15 minutes. At the end of the 15-minute period, the panels shall be lowered to a horizontal position. After the remover and comparison formula have been in contact with the panel finish for 2 hours, a gentle stream of tap water shall be flowed over the test areas while they are gently scrubbed with a soft bristle brush. The panels shall then be rinsed with distilled water and air dried. When dried, the remover-stripped areas shall be examined for any coating residue or remover residue exceeding that left by the comparison formula.

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4.9.8 Remover residue. Samples of the remover and comparison formula shall be flowed onto separate 3- by 6- inch aluminum alloy panels conforming to Specification QQ-A-250/4, T-3 condition. After the remover and comparison formula have been applied, the panels shall be placed at a 45-degree angle from the horizontal in an oven maintained at 38° C (100° F) for 15 minutes. At the end of the 15-minute period, the panels shall be removed from the oven, rinsed with a fine stream of warm tap water (50° to 70° F) then distilled water, and allowed to air dry. The sample remover and comparison formula panels shall then be compared for the presence of residue.

4.9.9 Corrosion.

4.9.9.1 Preparation of test panels. Sixteen test panels 1 inch by 2 inches and of any convenient thickness shall be prepared from the following metals:

- Two each - steel, Specification MIL-S-7952
- Two each - Tinplate, Specification QQ-T-425, type MR, Temper T-4, Class Electrolytic 25, bright finish
- Two each - magnesium alloy, Specification QQ-M-44 (AZ31B-H24), treated in accordance with Specification MIL-M-3171, type I
- Two each - magnesium alloy, Specification QQ-M-44(AZ31B-H-24), treated in accordance with Specification MIL-M-3171, type III
- Four each - aluminum alloy 2024, Specification QQ-A-250/4, T-3 condition
- Four each - aluminum 1100, Specification QQ-A-250/1, H-24 condition

The steel, tinplate and aluminum panels shall be washed with toluene after which they shall be cleaned with acetone-wet pumice conforming to Specification SS-P-821, grade FFFF, and rinsed with methyl alcohol. The magnesium panels shall be rinsed with acetone.

4.9.9.2 Single panel corrosion test. The steel, tinplate, and two each of the 2024 and 1100 aluminum panels shall be accurately weighed, placed singly at approximately a 45-degree angle in the smallest practicable jars, and completely covered with the remover. The jars shall be tightly sealed with a screw type cap having an aluminum foil (Specification MIL-A-148, Grade B) liner in addition to the usual pulp liner. After sealing, the jars shall be placed in an oven maintained at 38° C (100° F). At the end of 168 hours the brushing may be used if necessary to remove difficult residue.) The panels shall then be cleaned with acetone, dried, and weighed. Pitting, etching, or change in weight exceeding the following limits shall be considered as indicating corrosion:

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Steel	± 1.0 mg	2024 aluminum alloy	± 0.3 mg
Tinplate	± 0.4 mg	1100 aluminum	± 0.3 mg

4.9.9.3 Corrosion test for dissimilar metals.

4.9.9.3.1 Coupling of dissimilar metal test panels. The two remaining 2024 aluminum alloy panels prepared in accordance with 4.9.9.1 shall be coupled to the panels of magnesium alloy treated in accordance with Specification MIL-M-3171, type III. The two remaining 1100 (2S) aluminum panels (4.9.9.1) shall be coupled to the panels of magnesium alloy treated in accordance with Specification MIL-M-3171, type I. The size and placement of holes required for coupling shall be in accordance with figure 1. The panels shall be positioned and assembled in accordance with figure 2 and coupled with cadmium-plated steel screws, washers, and nuts as indicated below:

a. Screws conforming to Standard MS35206, Part No. MS35206-232, except cadmium plating shall be type I, class 1 of QQ-P-416 in lieu of type II, class 3.

b. Washers conforming to Standard AN960, Part No. AN960-6, except cadmium plating shall be type I, class 1, of QQ-P-416 in lieu of type II, class 3.

c. Nuts conforming to Standard MS35649, Part No. MS35649-262, cadmium plating shall be type 1, class 1, of QQ-P-416.

The assemblies shall be tightened with a torsion screw driver to 6 inch-pounds torque (see 6.5). The contact area shall be approximately 1 square inch. Each couple shall be checked to insure good electrical continuity.

4.9.9.3.2 Procedure. The coupled panels shall be placed at an angle (approximately 45 degrees) in separate jars of the smallest practicable size after which they shall be completely covered with remover. The jar shall be sealed as described in 4.9.9.2 and placed in an oven maintained at 38°C (100°F) for a period of 72 hours. The panels shall then be removed and immediately suspended vertically for 72 hours in a desiccator. Prior to the test, the desiccator shall be cleaned and the lower portion filled with distilled water after which it shall be closed and conditioned at $77^{\circ} \pm 2^{\circ}\text{F}$. During the test the desiccator shall be kept tightly sealed and in an area maintained at $77^{\circ} \pm 2^{\circ}\text{F}$. At the end of the 72-hour period the panels shall be removed, disassembled, washed with water, and cleaned with acetone. The individual panels shall then be inspected for pitting, etching, and corrosion products. (Slight surface etching under the washers on magnesium panels treated in accordance with Specification MIL-M-3171, type I, the total not to exceed 1/8 inch in diameter, shall not be cause for rejection.)

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4.9.10 Hydrogen embrittlement test.

* 4.9.10.1 Preparation of Test Specimens. Eleven notched tensile specimens are prepared from 4340 steel and of dimensions given in Figure 3 and described in WADC Technical Report 58-481 Hydrogen Embrittlement of Cadmium Coated Steel. The manufacture of the tensile test bars is as follows:

- a. Rough Machine blank.
- b. Normalize at $1625 \pm 25^\circ \text{ F}$ for one hour in salt bath. Bars shall lay flat and be separated during heat treatment.
- c. Air cool.
- d. Austentize at $1525 \pm 25^\circ \text{ F}$ for one hour in salt bath.
- e. Oil quench until warm to the hand.
- f. Cool at 80° F for one hour.
- g. Allow to warm to room temperature.
- h. Double temper four hours in air at temperature as indicated by quenched hardness:

53-54Rc	400°F
55-56Rc	450°F
57Rc or Greater	500°F

i. Finish to print dimensions given in the referenced report. Use a water cooled lathe so that temperature stays below 400° F . Four notched bars will be cadmium plated in a non-embrittling process as follows:

- a. Sand blast threaded ends only to clean metal.
- b. Clean entire bar by scrubbing with pumice and alkaline cleaner.
- c. Cold water rinse.

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d. Cadmium plate entire bar for eight minutes at 36ASF. Use chemically pure cadmium oxide. Solution is to be composed of: —

Cadmium Oxide	103gm/l
Sodium Cyanide	225gm/l
Brightner	none

Plating conditions:

Temperature	80° F
Agitation	none

e. Cold water rinse and blot dry.

f. Bake 23 hours at 375° F.

- * 4.9.10.2 Test Method. Four unplated and four plated notched bars will be statically loaded at 75% of their average notched ultimate tensile strength. While the bars are under load, the paint stripper will be applied to the notched specimen area, left in contact for 10 minutes then wiped off carefully with absorbent tissue. This application cycle will be repeated to give four (4) full cycles per day at two hour intervals until either 100 hours of exposure has elapsed or until failure. Stress is to remain on samples at all times. If no failure occurs, the application of material shall be stopped but the bars will be maintained under load for an additional 100 hours. There shall be no evidence of hydrogen embrittlement of the test specimen. Failure of any specimen of the group constitutes failure of the entire group. Break all test bars after test is complete to assure the ultimate tensile strength was correct.

4.9.11 Flammability.

4.9.11.1 Preparation of panel. A 1 by 6 inch panel shall be prepared from aluminum alloy conforming to Specification QQ-A-250/4, T-3 condition. The panel shall be cleaned and a hole drilled near one end to facilitate hanging. The panel shall then be dipped in a beaker of the remover and immediately suspended on a ring stand.

- * 4.9.11.2 Procedure. A micro-burner flame, not exceeding 3/16 inch in length shall be passed, within a 2 second period, back and forth along the lower edge of the panel. This operation shall be repeated a minimum of three times at 3 to 5 second intervals. If the remover ignites, the flame shall be removed from the panel and observation shall be made to ascertain whether the remover continues to burn.

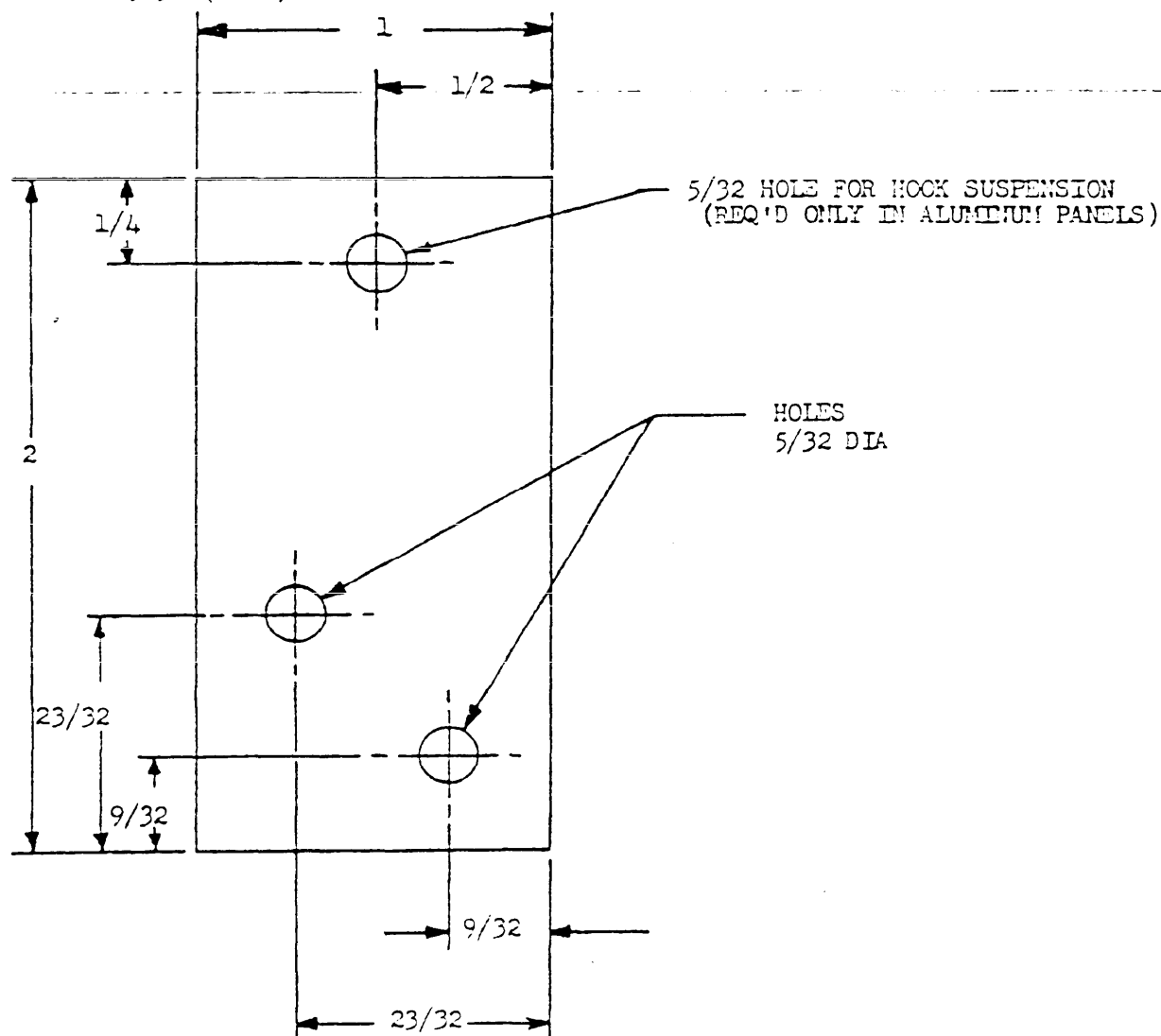
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4.9.12 Cold stability. Equal quantities of the remover shall be placed in two separate glass containers. One of the containers shall stand at room temperature while the other is cooled at a temperature of minus 10° C (14°F) for a period of 4 hours. At the end of the 4-hour period the cooled sample shall be permitted to return to room temperature after which both samples shall be agitated by moderate shaking for 30 seconds. After shaking, the samples shall be examined for any differences in appearance and consistency. They shall then be permitted to stand for 1 hour and the cooled sample observed for settling as compared to the uncooled specimen.

4.9.13 Storage stability. One of the 1-gallon samples of remover submitted in accordance with 4.4.1 shall be stored unopened at a temperature of 75° ± 5° F for 6 months. At the end of the storage period the container shall be opened and the contents tested for conformance to the requirements of this specification.

- * 4.9.14 Service test. The service test, performed by an AMA designated by the activity responsible for qualification, shall consist of field evaluation of the service test sample under service conditions conducted in accordance with standard operating procedures on as many aircraft as needed to determine suitability of the product for military use. The service test shall be performed when paint removers have met all the requirements of Section 3 including storage stability.
- * 4.10 Rejection criteria. If a sample fails to meet any of the test requirements of this specification, the lot represented by the sample shall be rejected.
- * 4.10.1 Lot. A lot shall consist of all paint remover manufactured at approximately the same time from the same batch of materials and submitted to the government at the same time.

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DIMENSIONS IN INCHES,
UNLESS OTHERWISE SPECIFIED,
TOLERANCES: DIMENSIONS SHOWN SHALL BE NOMINAL
EXCEPT THAT TOLERANCES FOR THE 3 BOLT HOLES
SHALL BE WITHIN LIMITS THAT WILL PERMIT
ASSEMBLY OF THE PANELS AS SHOWN IN FIGURE 2.

FIGURE 1. DIMENSIONS FOR DISSIMILAR METAL TEST PANELS

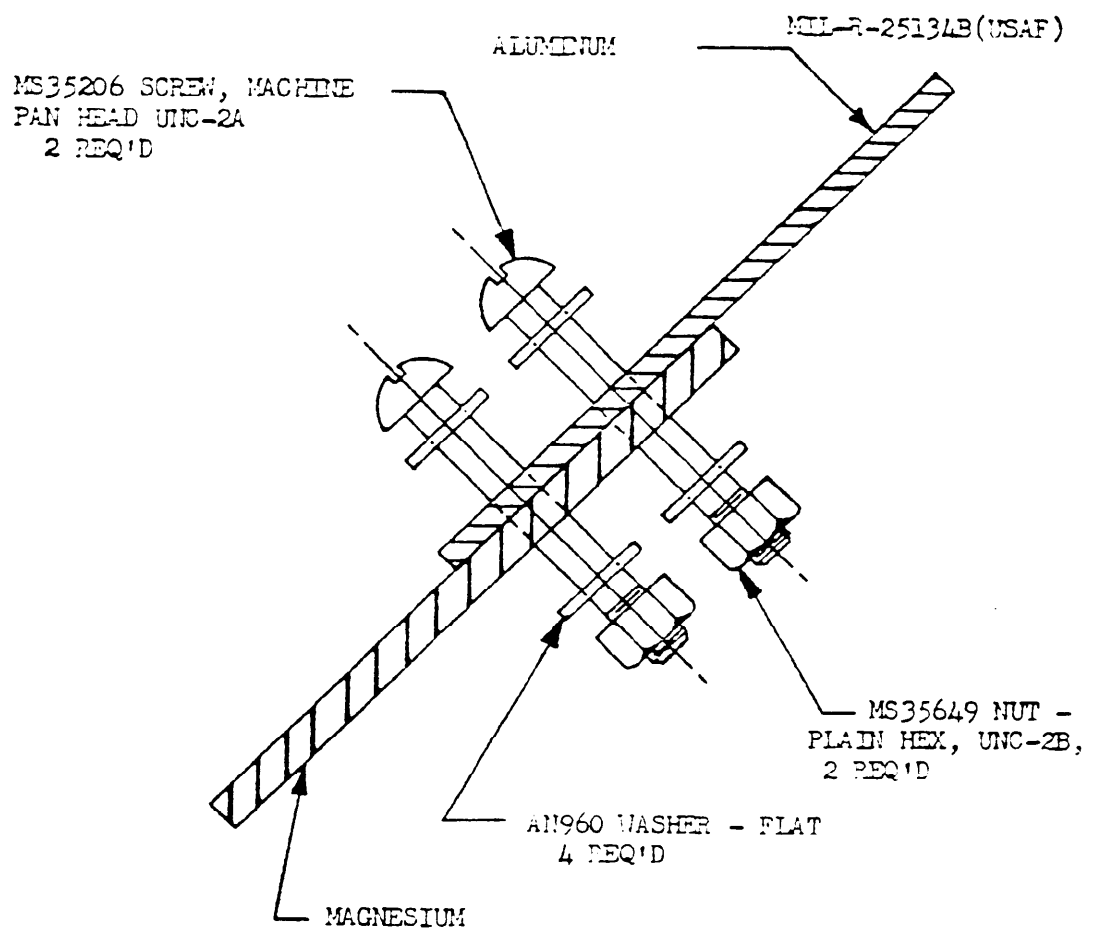


FIGURE 2. COUPLING OF DISSIMILAR METAL TEST PANELS

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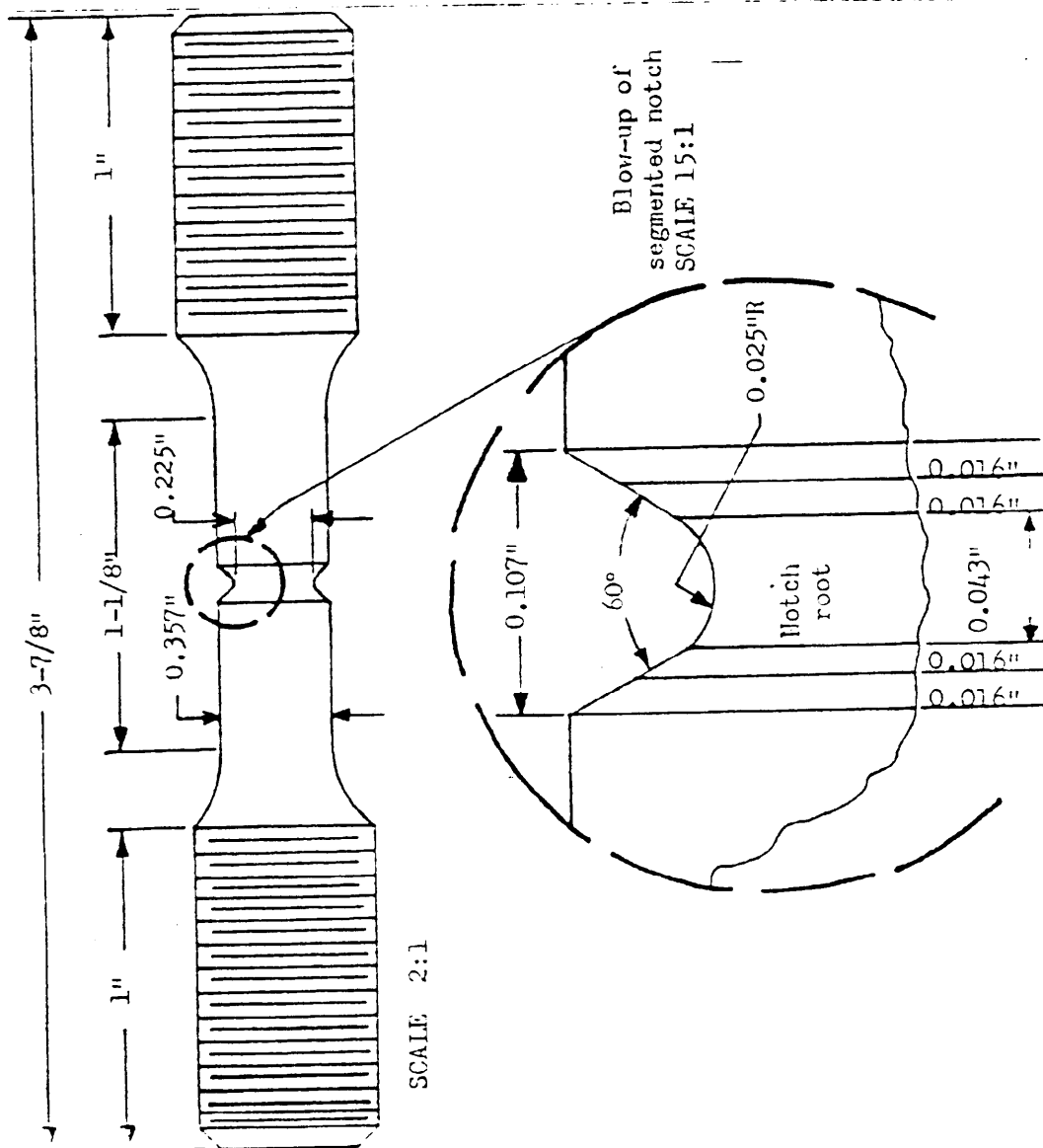


FIGURE 3. FABRICATED TEST SPECIMEN FOR HYDROGEN EMBRITTLEMENT TEST.

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5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. The remover shall be furnished in 1-gallon cans, 5-gallon pails, or 55-gallon drums as specified (see 6.2).

- * 5.1.1.1 One gallon cans. One-gallon cans shall conform to type V, class 6, of Specification PPP-P-704, Type 1 Classes 1 or 2. When specified, the cans shall be provided with a formed bridge-type handle securely affixed to the top.
- * 5.1.1.2 Five-gallon pails. Five-gallon pails shall conform to Specification PPP-P-704, type I, Classes 3, 4, or 5. Screw cap closures and inner seals shall be furnished. When specified, the drums shall also be furnished with a flexible pouring spout. Wire handles shall be treated to resist corrosion.

5.1.1.3 Fifty-five gallon drums. Fifty-five gallon drums shall conform to Specification PPP-D-729, type I. Cap seals shall be furnished on the drums. Exterior coating of the drums shall be required. Unless otherwise specified, the coating shall conform to Specification TT-E-485.

5.1.2 Level C. Packaging shall be in accordance with the manufacturer's commercial practice.

5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).

5.2.1 Levels A and B. Remover packaged in cans according to level A or C, as specified (see 6.2), shall be packed in accordance with the appendix to Specification PPP-P-704. Five-gallon pails or 55-gallon drums shall require no additional packing.

5.2.2 Level C. Remover packaged as specified in 5.1.2 shall be packed in a manner to insure carrier acceptance and safe delivery at destination. Containers shall be in accordance with Uniform Freight Classification Rules or regulations of other carriers applicable to the mode of transportation.

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5.3 Marking. Unit packages and exterior shipping containers shall be marked in accordance with the requirements of Standard MIL-STD-129. The shipment nomenclature shall be: Remover, Paint and Lacquer, Solvent Type.

5.3.1 Additional markings. In addition to the markings required by Standard MIL-STD-129, each unit container shall be durably and legibly marked with the following information:

WARNING: EXTREMELY IRRITATING VAPOR UNDER PRESSURE. Avoid contact with skin by releasing pressure slowly.

CAUTION: USE ONLY UNDER CONDITIONS OF ADEQUATE VENTILATION. EMPTY THIS CONTAINER AS SOON AS POSSIBLE AFTER OPENING. MAY BECOME FLAMMABLE DURING USE AS FIRE RETARDANT INGREDIENT EVAPORATES. AFTER APPLICATION ALLOW TO ACT ONLY AS LONG AS NECESSARY TO SOFTEN OR SWELL PAINT.

AVOID USE NEAR SOURCE OF IGNITION.

NOTE: This remover should be used by (date)._/

_/ Date shall be 6 months from date of manufacture and shall be indicated by month and year.

6. NOTES

6.1 Intended use. The paint remover covered by this specification is intended to be used for removing lacquer and enamel coating finishes from metal surfaces of aircraft or other surfaces.

6.1.1 The material conforming to this specification tends to have a slower paint removal rate and becomes more corrosive after aging in the container. Therefore it should be used within 6 months from the date of manufacture.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. That the unit of purchase and sale be a U. S. Gallon of 231 cubic inches at 77° F.
- c. Selection of applicable levels of packaging and packing.
- d. Size of containers (see 5.1.1).

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e. When bridge-type handle is required on 1-gallon cans (see 5.1.1.1).

f. When flexible pouring spout is required on 5-gallon pails (see 5.1.1.2).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is Commander Warner Robins Air Material Area, ATTN: WRAMA/12ETM, Robins Air Force Base, Georgia 31093, and information pertaining to qualification of products may be obtained from that activity.

6.4 Comparison formula. The comparison formula described in 4.7 does not conform to all of the requirements of this specification. It is intended as a means of standardization in order that certain desired properties may be obtained.

6.5 Container for test samples. Suitable 1-gallon shipping containers, 24 gauge, uncoated steel with 2-inch screw caps may be obtained from Rheem Manufacturing Company, 5001 Jefferson Highway, New Orleans, Louisiana, or from Vulcan Containers Inc., 1005 Mannheim Road, Chicago, Illinois.

6.6 The torsion screw driver specified in 4.9.9.3.1 should be a 0 to 12 inch-pound torque type. A screw driver of this type manufactured by Apco-Mossberg Company, Attleboro, Massachusetts, has been found to be satisfactory.

6.7 The margin of this specification are marked with an asterisk to indicate where changes (addition, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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