MIL-R-83936B (USAF)
13 January 1977
SUPERSEDING
MIL-R-83936A (USAF)
13 NOVEMBER 1972

MILITARY SPECIFICATION

REMOVER, PAINT, TANK TYPE; FOR AIRCRAFT WHEELS, LANDING GEAR COMPONENTS, AND OTHER AIRCRAFT AND AGE COMPONENTS

This specification is approved for use by Air Force, Department of the Defense, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for one type of activated solvent tank type paint remover for use on aircraft wheels, landing gear components, and other aircraft and AGE components.

1.2 Classification. This specification covers one type of non-phenolic, biodegradable paint remover.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

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)
PPP-D-729	Drums, Metal, 55 Gallon (For Shipment of Non-Corrosive Materials)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Warner Robins ALC/MMIRDA, Robins AFB GA 31098 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

Military

MIL-M-3171	Magnesium Alloy, Processes for Corrosion Protection of
MIL-S-7952	Steel, Sheet and Strip, Uncoated, Carbon (1020 and 1025)
MIL-P-7962	Primer Coating, Cellulose-Nitrate Modified Alkyd Type, Corrosion-Inhibiting, Fast-Drying (for Spray Application over Pre-treatment Coating)
MIL-C-8514	Coating Compound, Metal Pretreatment, Resin-Acid
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-L-19537	Lacquer, Acrylic-Nitrocellulose Gloss (for Aircraft Use)
MIL-P-23377	Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant
MIL-C-83286	Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

STANDARDS

Federal

FED-STD-595	Colors

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-831	Test Reports, Preparation of

(Copies of specifications, standards, drawings, and publication required by suppliers 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 to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

Federal Hazardous Substances Labeling Act

(Application for copies should be addressed to the U. S. Department of Health, Education and Welfare, Food and Drug Administration, Washington, D. C. 20203.)

3. REQUIREMENTS

3.1 Qualification. The remover furnished under this specification shall be a product which has passed the qualification tests specified herein and has been listed or approved for listing on the qualified products list at the time set for opening of bids.

3.2 Material. The material covered by this specification shall be a tank type paint remover consisting of organic solvents, wetting agents and other ingredients to produce a stable, homogeneous, satisfactory product. The viscosity shall not exceed 15 centipoises at 25° C. or at the manufacturer's recommended operating temperature when tested in accordance with Paragraph 4.6.2.

3.3 Composition. The formulation of the paint remover shall be optional with the supplier but shall be restricted by other requirements specified herein, and shall contain no phenols or phenol derivatives. The paint remover shall be a pourable liquid at ambient temperature and shall contain no materials which may be considered corrosive under applicable conditions. The use of a water or oil seal, no more than 15% by volume of the remover, is permissible to prevent evaporation of the remover in actual use.

3.4 Biodegradability. All surface active agents incorporated in the paint remover formulation shall be at least 90 percent biodegradable. The supplier shall furnish certification (from the manufacturer of the surface active agents) regarding biodegradability characteristics of the agents.

3.5 Toxicity. The paint remover shall have no adverse effect on the health of personnel when used for their intended purpose. The instructions for use of the paint remover shall include any necessary safety precautions for handling materials containing components hazardous to health such as phenols. The chemical composition/toxicological data of the paint remover shall be supplied to Warner Robins ALC/MMIRDA, Robins AFB, GA 31098 to evaluate the occupational and environmental protection necessary to utilize the paint remover in Air Force activities. The AFLC Surgeon's Office (AFLC/SGP), WPAFB, Ohio, 45433, is available to provide consultant assistance in this evaluation.

3.6 Requirements. Physical and chemical properties of the paint remover shall meet the requirements of Table I when tested in accordance with the indicated method.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. 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.

4.1.1 Backup material to be used with the sealant shall

TABLE I

PHYSICAL AND CHEMICAL REQUIREMENTS

PROPERTY	REQUIREMENT	TEST METHOD	
Flammability	Self Extinguishing within 3 seconds	Para 4.6.1	*
Viscosity	15 CP at 25° C or at mfr's recommend. temp.	Para 4.6.2	*
Corrosion	Not to exceed limits per Para 4.6.3, Table II	Para 4.6.3	*
Paint Removal Performance	Visible attack and lifts 95% of finishes, shall not remove MIL-A-8625	Para 4.6.4	*
Hydrogen Embrittlement	Shall not produce tensile failure	Para 4.6.5	
Storage Stability 6 months	Meet all requirements of specification	Para 4.6.6	

* DENOTES REQUIREMENTS TO BE CHECKED FOR LOT ACCEPTANCE TESTING PER PARA 4.5.2

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

(a) Qualification inspection (see 4.3)

(b) Quality conformance inspection (see 4.4).

4.3 Qualification inspection. Qualification tests shall consist of all of the tests specified in Table I.

4.3.1 Qualification samples. Unless otherwise specified, 2 one-gallon containers of paint remover shall be submitted for test by the supplier. The samples shall be plainly identified and forwarded to the qualifying activity or as otherwise directed in the letter of authorization from the qualifying activity (see Paragraph 6.3). The identification shall include the supplier's production code or compound number, and date of compounding or manufacture.

4.3.2 Test report. Qualification samples shall be accompanied by a certified test report showing results of all tests required by this specification except the test for inspection of filled containers, and the 6-month storage stability test. Test report shall follow MIL-STD-831 format.

4.3.2.1 Instruction sheet. The supplier shall forward 3 copies of the instruction sheet detailing required mixing techniques and application procedures with all qualification samples submitted for approval. Qualification approval of the supplier's paint remover shall also constitute approval of the applicable instruction sheets. The instruction sheets shall not be changed in any way without specific approval of the qualifying activity.

4.4 Quality conformance inspection. Quality conformance inspection for acceptance of individual lots shall consist of sampling and tests as noted by asterisks in Table I and as specified herein.

4.4.1 Sampling.

4.4.1.1 Lot. A lot shall consist of paint remover produced by one supplier with no change in process or materials, provided the operation is continuous In the event the process is a batch process, each batch shall constitute a lot.

4.4.1.2 Sampling for inspection of 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 percent defective to verify compliance with this specification regarding fill, closure marking and other requirements not involving tests.

4.4.1.3 Sampling for tests. Two containers shall be selected at random from each inspection lot. If more than one lot is represented in the shipment, each lot represented shall be treated as a separate shipment for sampling purposes. The contents of each container having been selected at random for sampling shall be thoroughly mixed immediately prior to sampling. Each sample shall be tested to determine compliance with this specification.

4.5 Quality assurance inspection.

4.5.1 Inspection of filled containers. Each sample filled container selected in accordance with 4.4.1.2 shall be examined for defects of the container and the closure for evidence of leakage, and for unsatisfactory marking; each sample filled container shall also be weighed to determine the amount of contents. Any container in the sample, having one or more defects, or under required fill, shall be rejected and if the number of defective containers in any sample exceeds the acceptance number for the applicable sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

4.5.2 Lot acceptance tests. The samples selected in accordance with 4.4.1.3 shall be subjected separately to the tests identified by an asterisk (*) in Table I. If either sample fails one or more of these tests, the lot shall be rejected.

4.6 Test procedures.

4.6.1 Flammability. A 1 x 6 inch (2.54 cm x 15.24 cm) panel shall be prepared from aluminum alloy conforming to Specification QQ-A-250/4. A hole shall be drilled near one end to facilitate hanging. The panel shall be dipped into a container of the paint remover and immediately suspended on a ring stand. A microburner flame, not exceeding 3/16 inch (4.76 mm) in length shall be passed back and forth along the lower edge of the panel within a 1 second period. This operation shall be repeated three times at 5 second intervals. If the paint remover ignites, the burner flame shall be removed and observation made to determine whether the paint remover continues to burn. Burning duration in excess of 3 seconds after removal of the flame shall be cause for rejection. Results shall be reported.

4.6.2 Viscosity. Viscosity of the active phase of the paint remover shall be determined at 77 ± 2 F (25 ± 1 C) or at manufacturer's operating recommended temperature, using a Model LVF Brookfield Viscosimeter, or its equivalent. Readings shall be taken after the spindle has been operating for a minimum of three minutes, and reported.

4.6.3 Corrosion. Two specimens, 1 x 2 inches (2.54 cm x 5.08 cm) shall be prepared from each of the metals listed in Table II. Each specimen shall be weighed to the nearest 0.1 MG, placed singly in suitable glass jars at approximately a 45° angle, and completely covered with the paint remover. The jars shall be loosely capped with screwtype cap having an aluminum foil liner in addition to the usual pulp liner, and placed in a suitable conditioning chamber at 100 F (38 C), or at the manufacturer's recommended operating temperature, for a total exposure period of 24 hours. At the end of the exposure period, the specimens shall be removed from the conditioning chamber and thoroughly rinsed with tap water. (Light brushing may be used if necessary to remove difficult residue). The specimens shall then be thoroughly rinsed with acetone, air dried, and re-weighed to the nearest 0.1 MG. Pitting, etching, or weight changes exceeding the limits of Table II shall be cause for rejection. Results shall be reported.

4.6.4 Paint removal performance.

4.6.4.1 Preparation of test panels. Six test panels, 3" x 6" x 1/16", of each of the metals and treatment as specified in Table III shall be prepared.

4.6.4.2 Painting of test panels. After the test panels have been prepared as specified in Table III, three panels of each metal shall be painted with the coating systems as specified in Table IV. All paint topcoats shall be color # 17875 in accordance with Federal Standard 595.

4.6.4.3 Paint removal procedure. Three test panels of each metal specified in Table III, and painted with each coating system specified in Table IV, shall be immersed in a container of the paint remover maintained at 77° F ± 20° F (25° C ± 1° C) or at the manufacturer's recommended temperature for a period of 30 minutes. At the conclusion of the test period the test panels shall be rinsed with a water spray (hot or cold) not exceeding 100 psi. The test panels shall be air dried and examined for compliance with the requirements of Table I. Percentage of paint system removed shall be reported.

TABLE II

METAL	SPECIFICATION	SURFACE TREATMENT	WT CHANGE
Aluminum	QQ-A-250/4	As Received	± 0.3 MG
Aluminum	QQ-A-250/4	MIL-A-8625 Type II, Class 1	- 0.3 MG
Magnesium	QQ-M-44 (AZ31B-H24)	MIL-M-3171, Type I	± 5.0 MG
Magnesium	QQ-M-44 (AZ31B-H24)	MIL-M-3171, Type III	± 5.0 MG
Steel	MIL-S-7952	As Received	± 1.0 MG
Steel	MIL-S-7952	Cadmium Plated Per QQ-P-416, Type II, Class II	± 10.0 MG

NOTE: All panels shall be cleaned by boiling in CP isopropanol for five minutes, rinsing with CP methanol, and air dry prior to surface treatment and testing.

TABLE III

METAL	SPECIFICATION	SURFACE TREATMENT
Aluminum	QQ-A-250/4	MIL-A-8625, Type II, Class I, Dichromate Seal
Magnesium	QQ-M-44 (AZ31B-H24)	MIL-M-3171, Type III
Steel	MIL-S-7952	QQ-P-416, Type II, Class II

NOTE: All panels shall be cleaned by boiling in CP isopropanol for five minutes, rinsing with CP methanol, and air dry prior to surface treatment and testing.

TABLE IV

COATING SYSTEM	DRY FILM THICKNESS	DRYING TIME STD CONDITIONS
A. Wash Primer, MIL-C-8514	0.3 - 0.5 mils	1 hr
Primer, MIL-P-7962	0.3 - 0.5 mils	30 min
Topcoat, MIL-L-19537	2 coats 0.5 - 0.7 mils each	8 hrs
B. Epoxy Primer MIL-C-23377	0.5 - 0.9 mils	1 hr
Urethane Topcoat, MIL-C-83286	2 coats 0.8 - 1.1 mils each	4 hrs between coats. 48 hrs after last coat

After coating systems are applied and cured as above, all panels shall be baked for 96 hours at 210 ± 10 F (99 ± 6 C) cooled to ambient temperature and stored in a desiccator (or equivalent) until used for test.

4.6.5 Hydrogen embrittlement. Notched steel test specimens shall be prepared from 4340 steel heat treated to 260,000 - 280,000 psi (1790 - 1930 MPa) as detailed in Figure 1. Ultimate tensile strength shall be determined on a sufficient number of specimens to establish the ultimate tensile strength value. Four notched specimens shall then be plated and processed per Table V, then placed in suitable loading fixtures and loaded to 75% of the previously determined ultimate tensile strength for the entire test exposure time. The active phase of the paint remover shall be painted on the specimen notch area, left in contact for 10 minutes, then wiped off carefully with absorbent paper or lint-free cloth. This paint remover application procedure shall be repeated four times daily at 2 hour intervals until 200 continuous hours (4.2 days) exposure has elapsed. Tensile failure of the steel specimen or specimens during the 200 hour exposure shall be cause for rejection due to hydrogen embrittlement.

4.6.6 Six month storage stability. A one gallon (3.8 liter) container of the paint remover shall be stored unopened at a temperature of 75 ± 5 F (24 ± 3 C) for a period of six months. At the end of the storage period, the container shall be examined for visual signs of paint remover deterioration. Any bulging of the container due to pressure build-up or signs of deterioration of the container lining or material separation shall be cause for rejection. The paint remover shall then conform to all the requirements of this specification.

5. PREPARATION FOR DELIVERY

5.1 Packaging.

5.1.1 Level A. Unless otherwise specified, the paint remover shall be furnished in 55-gallon (208 liter) drums conforming to PPP-D-729 Type II. The size of the containers shall be specified by the procuring activity.

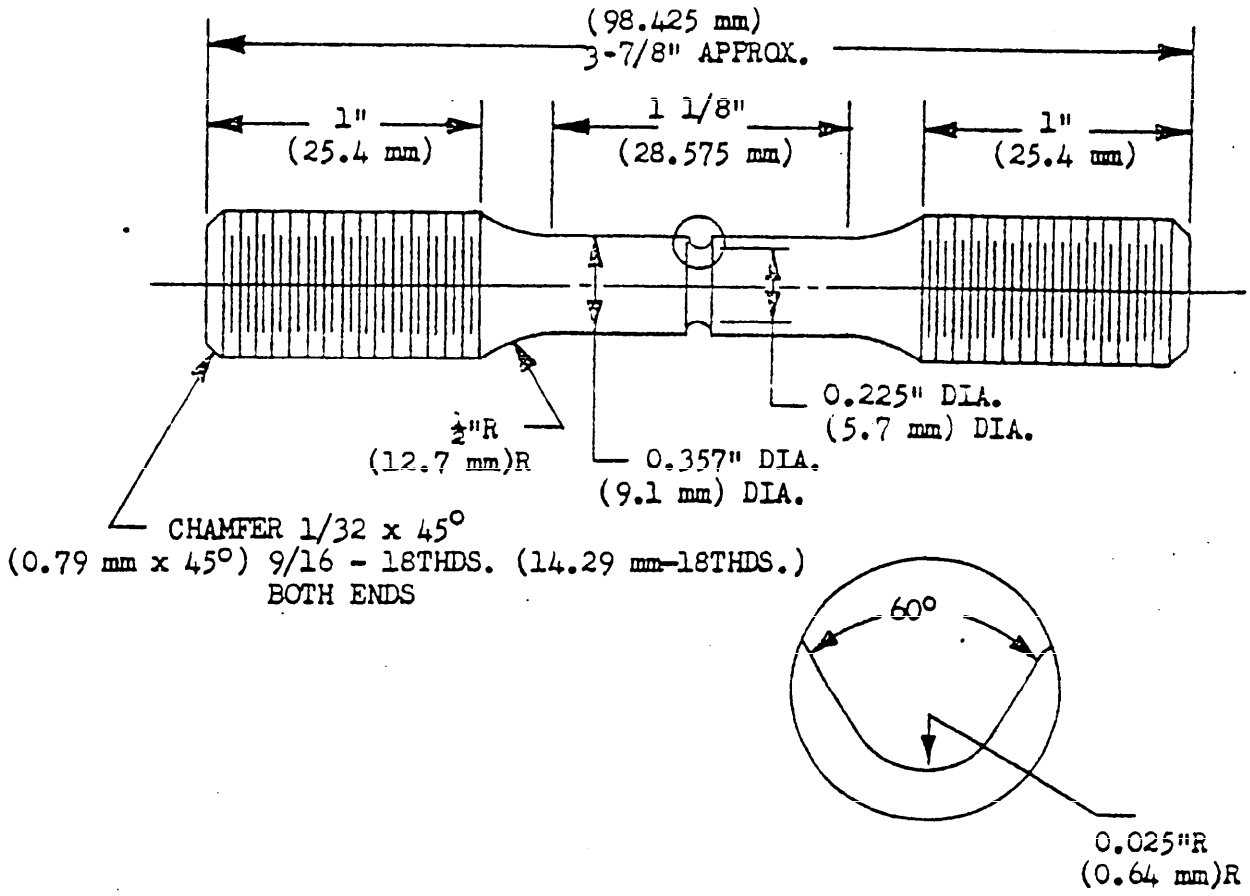

Figure 1

Notched Hydrogen Embrittlement Specimen

TABLE V

CADMIUM PLATING AND PROCESSING OF NOTCH SPECIMENS

Pre-plate Processing

1. Vapor Degrease
2. Light Sandblast with Size 120 Aluminum Oxide Abrasive
3. Water Rinse and Immerse Wet in Plating Solution

Plating

Time:	7 Minutes
Current Density:	50 AMPS/Sq Ft (538 AMPS/M^2)
Bath Temperature:	70 - 90 F (21 - 32 C)
Bath Composition: *	
Cadmium Metal (As Oxide)	4.5 Oz/Gal (33.75 GMS/Liter)
Free Sodium Cyanide **	13.6 Oz/Gal (102 GMS/Liter)
Ratio NaCN-CdO = 3.0	
Sodium Hydroxide	2.9 Oz/Gal (21.75 GMS/Liter)

* No Brightener is to be Used in Bath

** As Excess Sodium Cyanide Above that Required to Form $NaCd(CN)_3$

Post-Plate Processing

1. Rinse thoroughly in Running Tap Water
2. Immerse in 4% Chromic Acid at 70 F (32 C) for 5 Seconds
3. Rinse in Running Tap Water
4. Forced Air Dry
5. Within 30 Minutes after Plating, Bake at 375 ± 10 F (190 ± 5 C) for 23 Hours
6. Cool to Ambient Temperature

5.1.2 Level C. Unless otherwise specified, packaging shall be in accordance with the supplier's commercial practice.

5.2 Packing.

5.2.1 Level A. Paint remover packaged in accordance with 5.1.1 will require no overpacking.

5.2.2 Level C. Paint remover packaged in accordance with 5.1.2 shall be packed to afford protection against damage during direct shipment from the supply source to the first receiving activity for immediate use. Containers shall comply with Consolidated Freight Classification rules or other common carrier regulations applicable to the mode of transportation.

5.3 Marking. Containers shall be marked in accordance with MIL-STD-129. The shipment marking nomenclature shall be: Paint Remover, Activated Solvent Type.

5.3.1 Additional marking. Each container shall be durably and legibly marked with the following information:

Warning: Avoid contact with skin. Open container slowly to relieve pressure. Use at ___° F operating temperature.

Caution: Use only under conditions of adequate ventilation. Empty this container as soon as possible after opening.

Note: This remover shall be used by (**).

** 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 difficult to remove paint finishes from aircraft wheels, landing gears, and other components.

6.2 Ordering data. Paint remover conforming to this specification tends to have a slower removal rate and becomes more corrosive after aging in the container. Therefore, it should be used within 180 days from the date of manufacture. Procuring agencies are cautioned to order only those quantities of paint remover for use within a six month period or to stagger procurement to maintain minimum surplus quantities. Procurement documents shall specify the following:

a. Title, number and date of this specification.

b. Quantity of paint remover desired.

c. Type and size of container.

d. Selection of applicable levels of preservation, packaging and packing (see section 5).

e. Unit of purchase and sale shall be a U. S. Gallon of 231 cubic inches at 77 ± 2 F (25 ± 1 C).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have been so listed by that date. The attention of the suppliers is called to this requirement, and suppliers 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 product covered by this specification. The activity responsible for the Qualified Products List is the Warner Robins ALC, Attn: MMIRDA, Robins Air Force Base, GA 31098, and information pertaining to qualification of products may be obtained from that activity.

Custodian:
Air Force - 99

Preparing Activity:
Air Force - 99

Project No. 8010-F033

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1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
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5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Incl Code)* – Optional
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