

MIL-C-85054A(AS)

26 October 1985

~~SUPERSEDING~~

MIL-C-85054(AS)

23 March 1977

MILITARY SPECIFICATION

CORROSION PREVENTIVE COMPOUND, WATER DISPLACING,
CLEAR (AMLGUARD)

This specification is approved for use by Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a clear water displacing corrosion preventive compound which may be applied from gas pressurized containers, brushing or spraying (see 6.1).

1.2 Classification. The compound shall be furnished in the following types (see 6.2).

Type I - Pressurized Spray Container (for spray application)

Class A - Chlorofluorocarbon propellant

Class B - Hydrocarbon propellant

Type II - Bulk Form

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Federal

BB-F-1421

Fluorocarbon Refrigerants

QQ-A-250/4

Aluminum Alloy 2024, Plate and Sheet

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Systems Engineering and Standardization Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

FSC 8030

MIL-C-85054A(AS)

SPECIFICATIONS (Continued)

Federal (Continued)

QQ-A-250/5	Aluminum Alloy Alclad 2024, Plate and Sheet
QQ-A-671	Anodes, Cadmium
QQ-B-626	Brass, Leaded and Nonleaded, Rod, Shapes, Forgings and Flat Product TH Finished Edges (Bar and Strip)
QQ-C-576	Copper Flat Products With Slit, Slit and Edge-rolled, Sheared, Sawed, or Machined Edges (Plate, Bar, Sheet and Strip)
QQ-M-44	Magnesium Alloy, Plate and Sheet (AZ31B)
QQ-S-766	Steel Plate, Sheet, and Strip-Corrosion Resisting
TT-I-735	Isopropyl Alcohol
TT-M-261	Methyl, Ethyl Ketone, Technical
TT-N-95	Naptha, Aliphatic
TT-T-291	Thinner, Paint, Mineral Spirits, Regular and Odorless
MMM-A-250	Adhesive, Water-resistant (for Closure of Fiberboard Boxes)
PPP-B-636	Box, Shipping, Fiberboard
PPP-C-96	Can, Metal, 28 Gage and Lighter

Military

MIL-S-7952	Steel, Sheet and Strip, Uncoated, Carbon (1020 and 1025) (Aircraft Quality) (Asg)
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 (Asg)
MIL-A-18001	Anode, Corrosion Preventive, Zinc; Slab Disc and Rod Shaped
MIL-L-19537	Lacquer; Acrylic-nitrocellulose, Gloss (for Aircraft Use)
MIL-S-22805	Spray Kit, Self Pressurized

STANDARDS

Federal

- FED-STD-313 Material Safety Data Sheets, Preparation and Submission of
- FED-STD-791 Lubricant, Liquid Fuel, and Related Products, Methods of Testing

Military

- MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-290 Packaging of Petroleum and Related Products

(Copies of specifications, standards, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.1.2 Other Government documents, drawings and publications.
The following other Government documents, drawings and publications form a part of this specification to the extent specified herein.

Code of Federal Regulations

- 49 CFR 171-190 Department of Transportation Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Officer, Washington, DC 20402.)

2.1.3 Order of precedence. In the event of conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issue of the document which is indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

- ANSI Z129.1 American National Standard for the Precautionary Labeling of Hazardous Industrial Chemicals

(Single copies of the ANSI document are available from the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

MIL-C-85054A(AS)

3. REQUIREMENTS

3.1 First article inspection. The compound furnished under this specification shall be a product which has been inspected and has passed the first article inspection specified herein (see 4.3 and 6.2).

3.2 Materials.

3.2.1 Contents, type I container. The contents of type I containers shall consist of 11 ounces of the corrosion preventive compound formulated as listed in table I and sufficient propellant to completely exhaust, by spraying, the entire contents of the container in a satisfactory manner. Fluorocarbon propellant No. 12 conforming to BB-F-1421 shall be used for class A and a compatible hydrocarbon type propellant shall be used for class B. (Paragraph 6.4 references table III which lists a source of materials that meets the formulation requirements of this specification.)

3.2.2 Contents, type II container. The contents of each quart size container of type II shall consist of the corrosion preventive compound formulated as listed in table I. (Paragraph 6.4 references table III which lists a source of materials that meets the formulation requirements of this specification.)

TABLE I. Compound ingredients.

Ingredients	Specification or infrared spectrum	Percent by weight
Isopropanol	TT-I-735	4.6
Barium petroleum sulfonate	Figure 1	4.0
Alkyl ammonium organic phosphate	Figure 2	1.0
Silicone resin	Figure 3	10.2
Silicone alkyd resin	Figure 4	30.0
Aromatic hydrocarbon	Figure 5	21.2
Trichlorotrifluoroethane		29.0
Solvent blue 36 1/		2.5 mg/100 ml

1/ Oil blue A - E. I. Dupont de Nemours and Company or equal.

3.2.3 Compound ingredients. The ingredients used in the manufacture of the compound shall conform to the applicable Government specification or be chemically identical to spectrums listed in table I. The compound shall be homogeneous, free from grit, abrasives, water, chlorides and other impurities.

3.2.4 Color. The blue dye is added to the corrosion preventive compound to give a bluish hue.

3.2.5 Material Safety Data Sheets. A Material Safety Data Sheet shall be prepared and submitted in accordance with FED-STD-313. Questions pertinent to the effect of the corrosion preventive on the health of personnel when used for its intended purpose shall be referred by the acquiring activity to the appropriate medical service who will act as adviser to the acquiring activity (see 3.3.1, 4.3.1, 4.9 and 6.2).

MIL-C-85054A(AS)

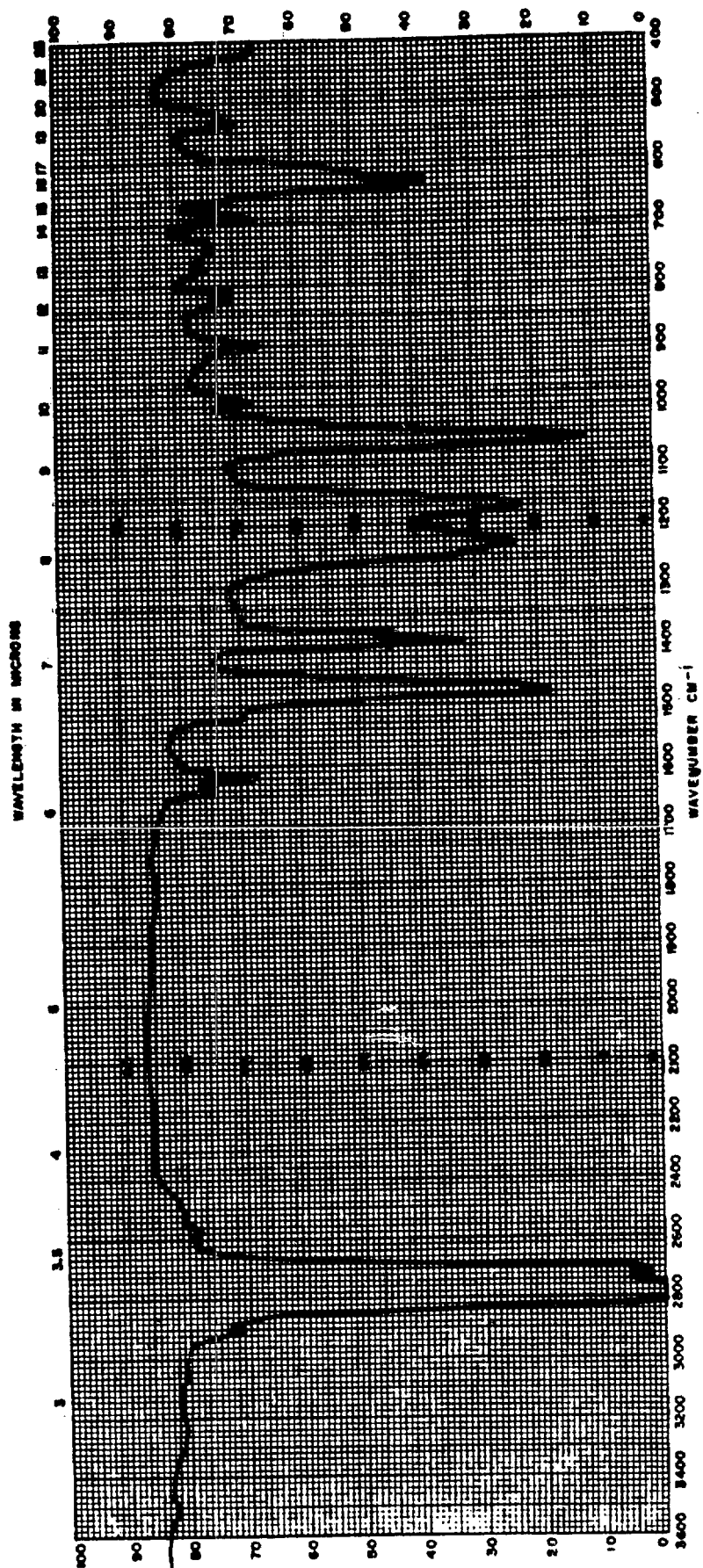


FIGURE 1. Infrared spectrum of barium petroleum sulfonate.

MIL-C-85054A(AS)

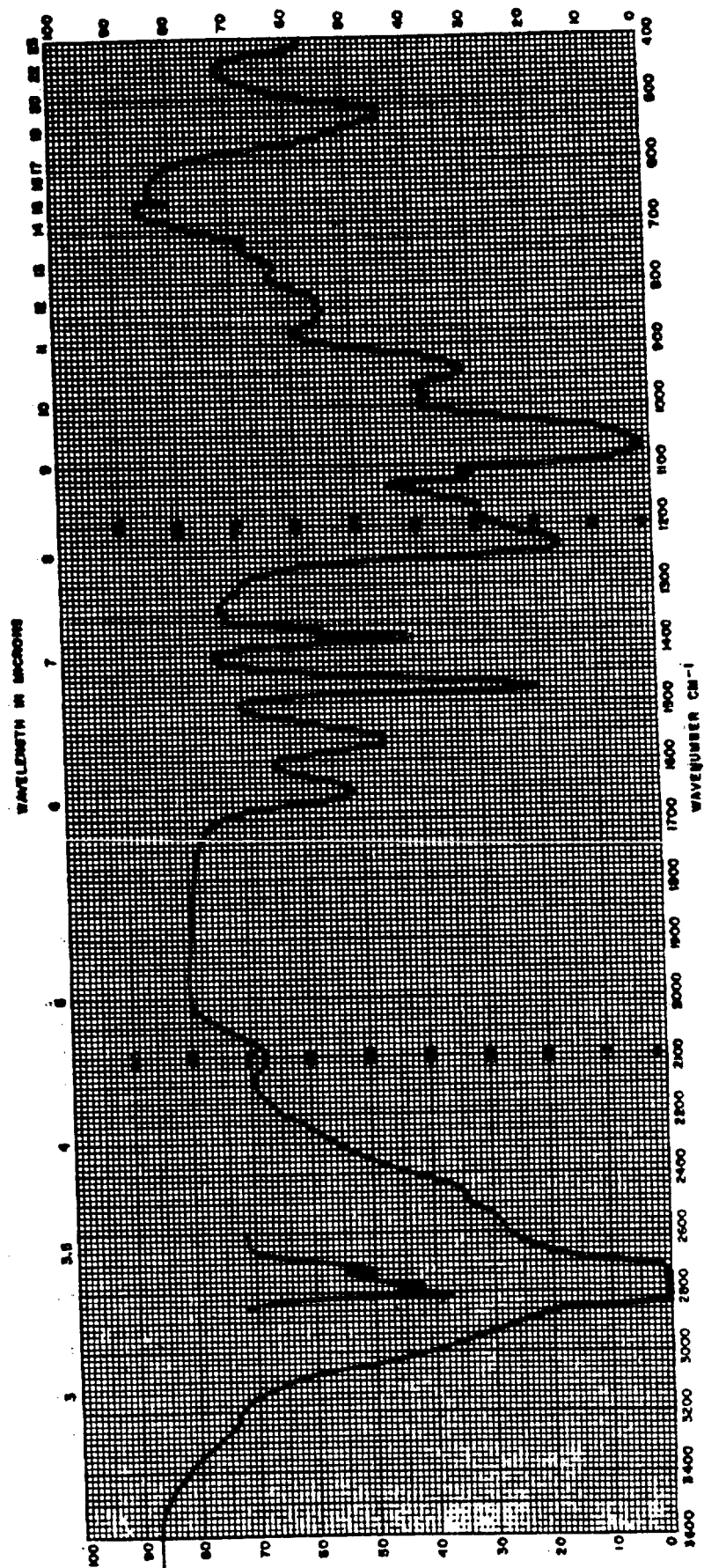


FIGURE 2. Infrared spectrum of alkyl ammonium organic phosphate.

MIL-C-85054A(AS)

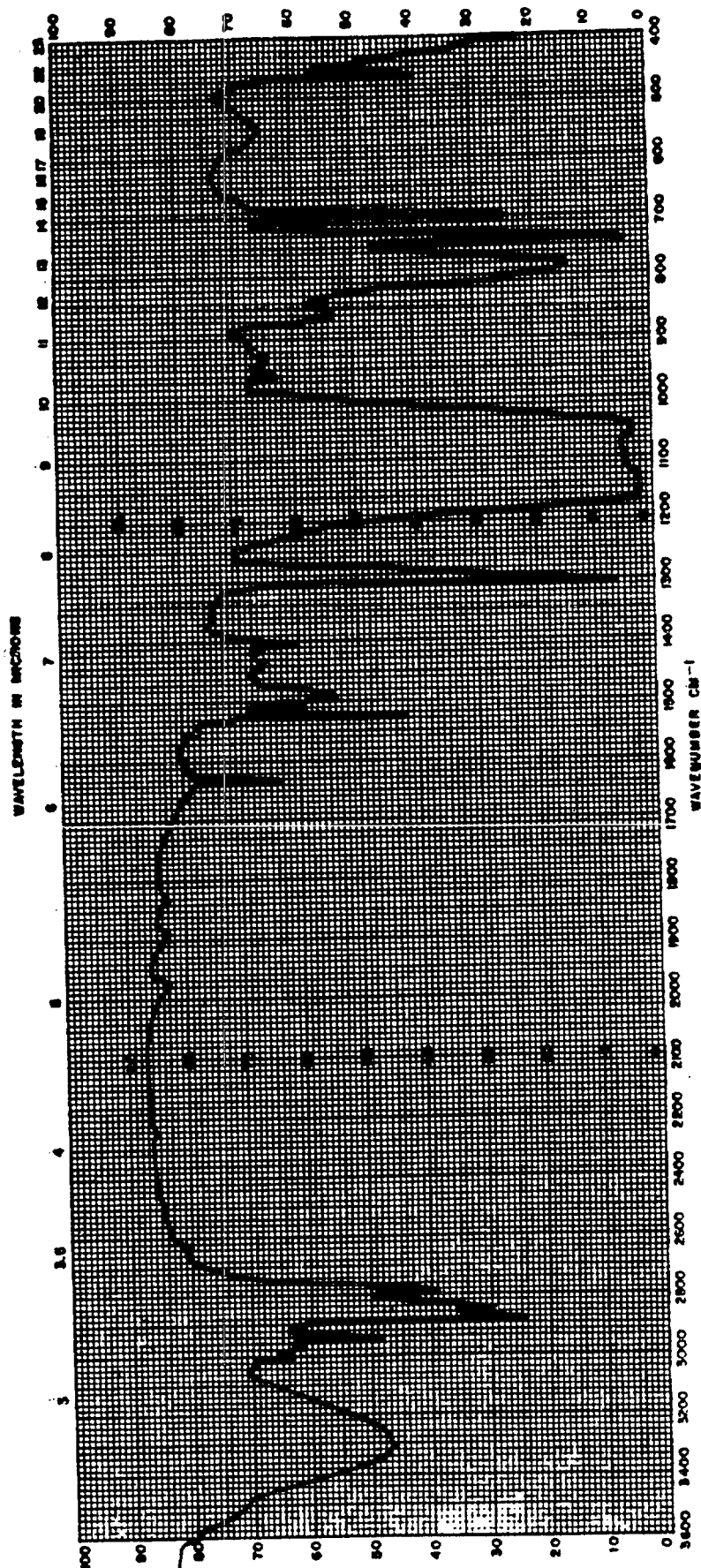


FIGURE 3. Infrared spectrum of silicone resin.

MIL-C-85054A(AS)

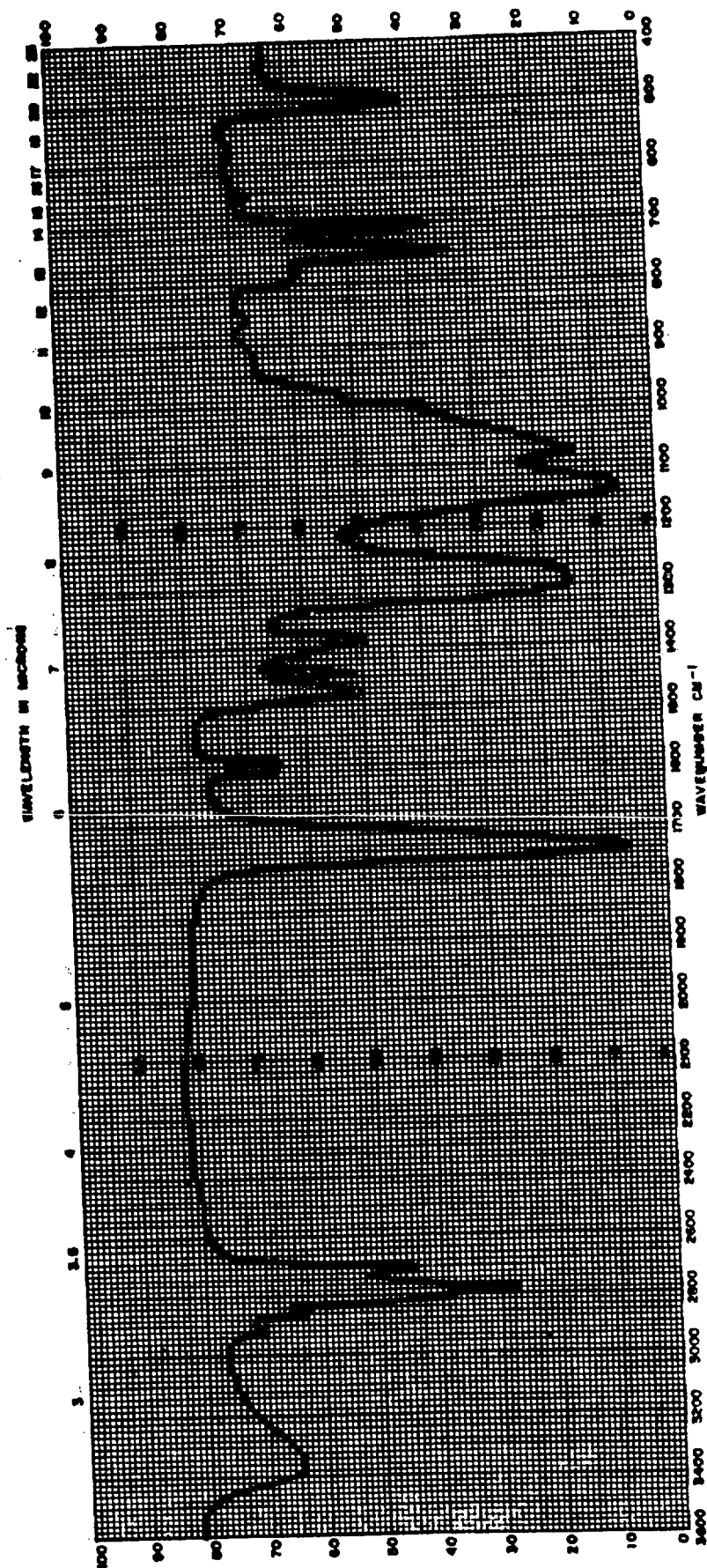


FIGURE 4. Infrared spectrum of silicone alkyd resin.

MIL-C-85054A(AS)

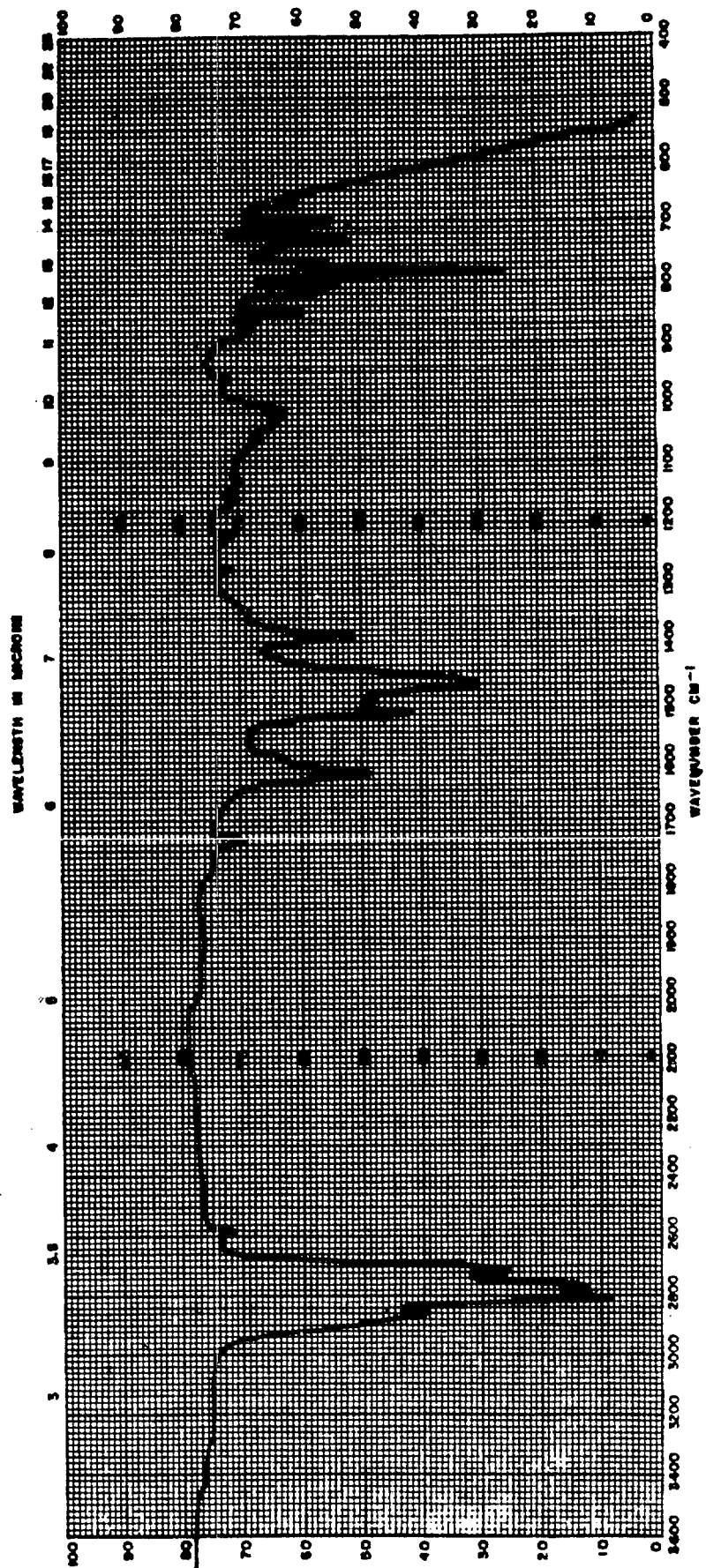
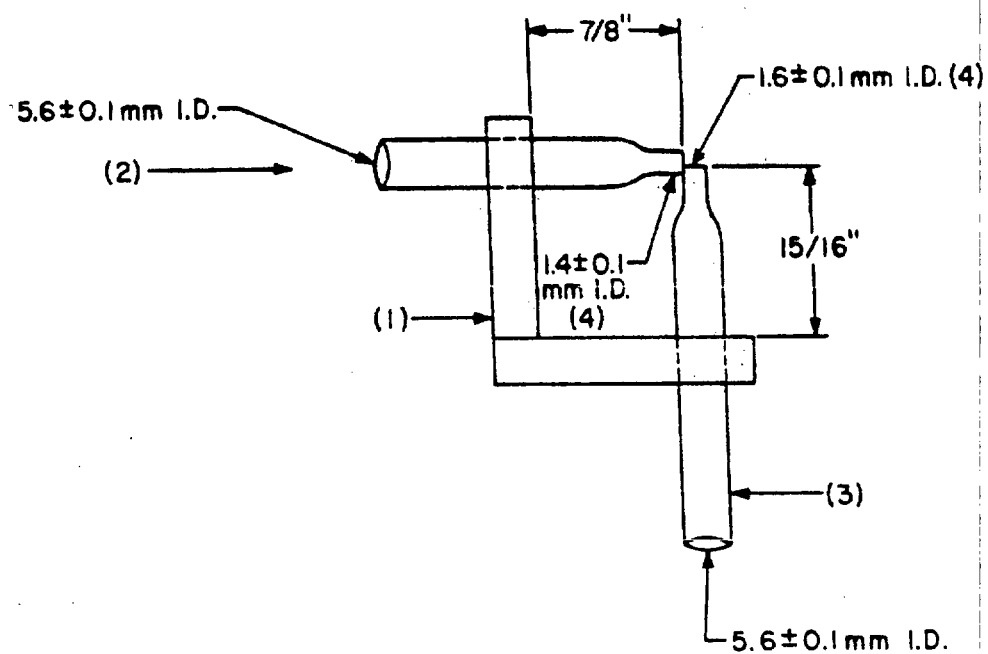


FIGURE 5. Infrared spectrum of aromatic hydrocarbon.

MIL-C-85054A(AS)

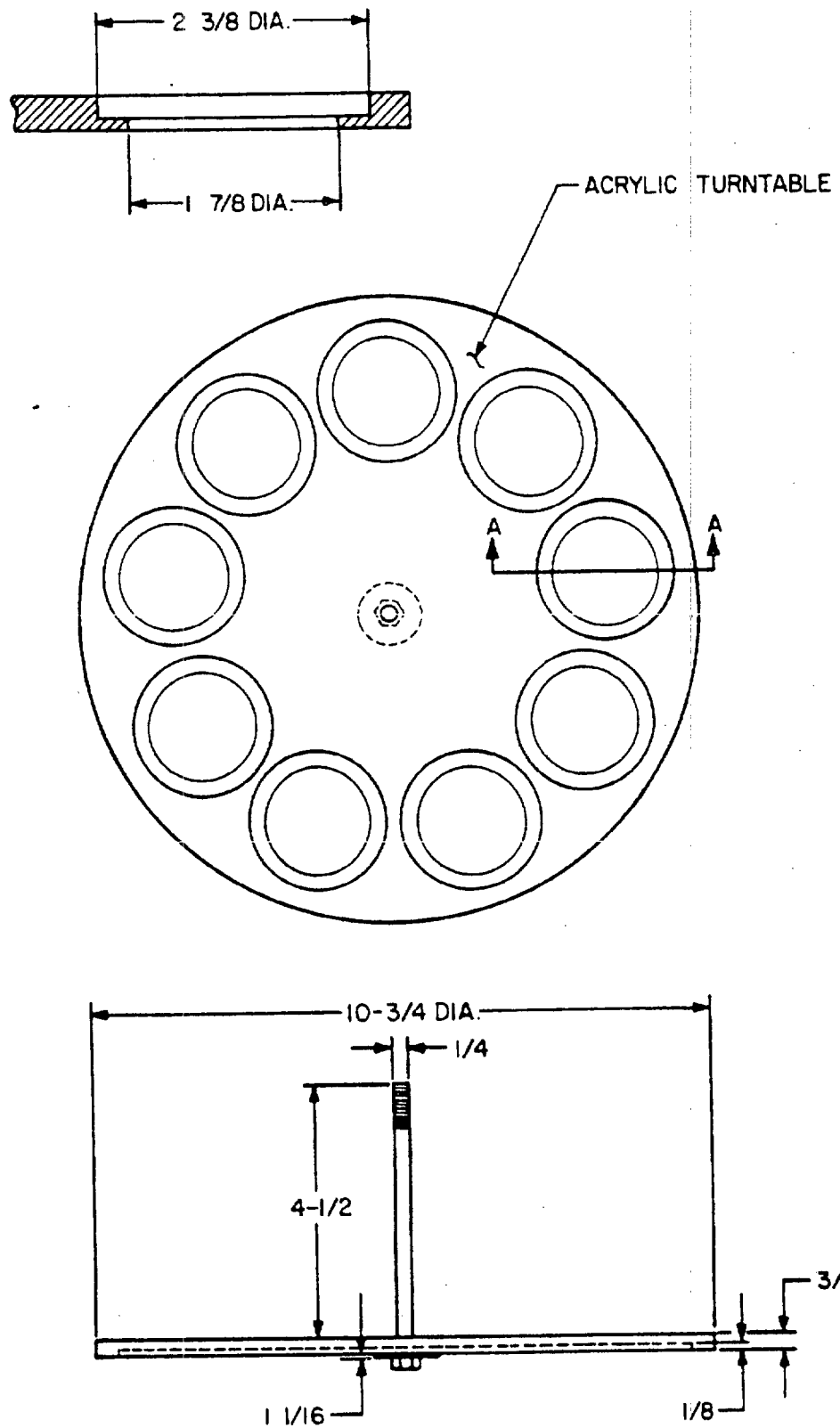


NOTES:

1. 1/4" Acrylic Material
2. Filtered Air Source
3. Liquid Pick-Up Tube
4. Orifice

FIGURE 6. Spray nozzle.

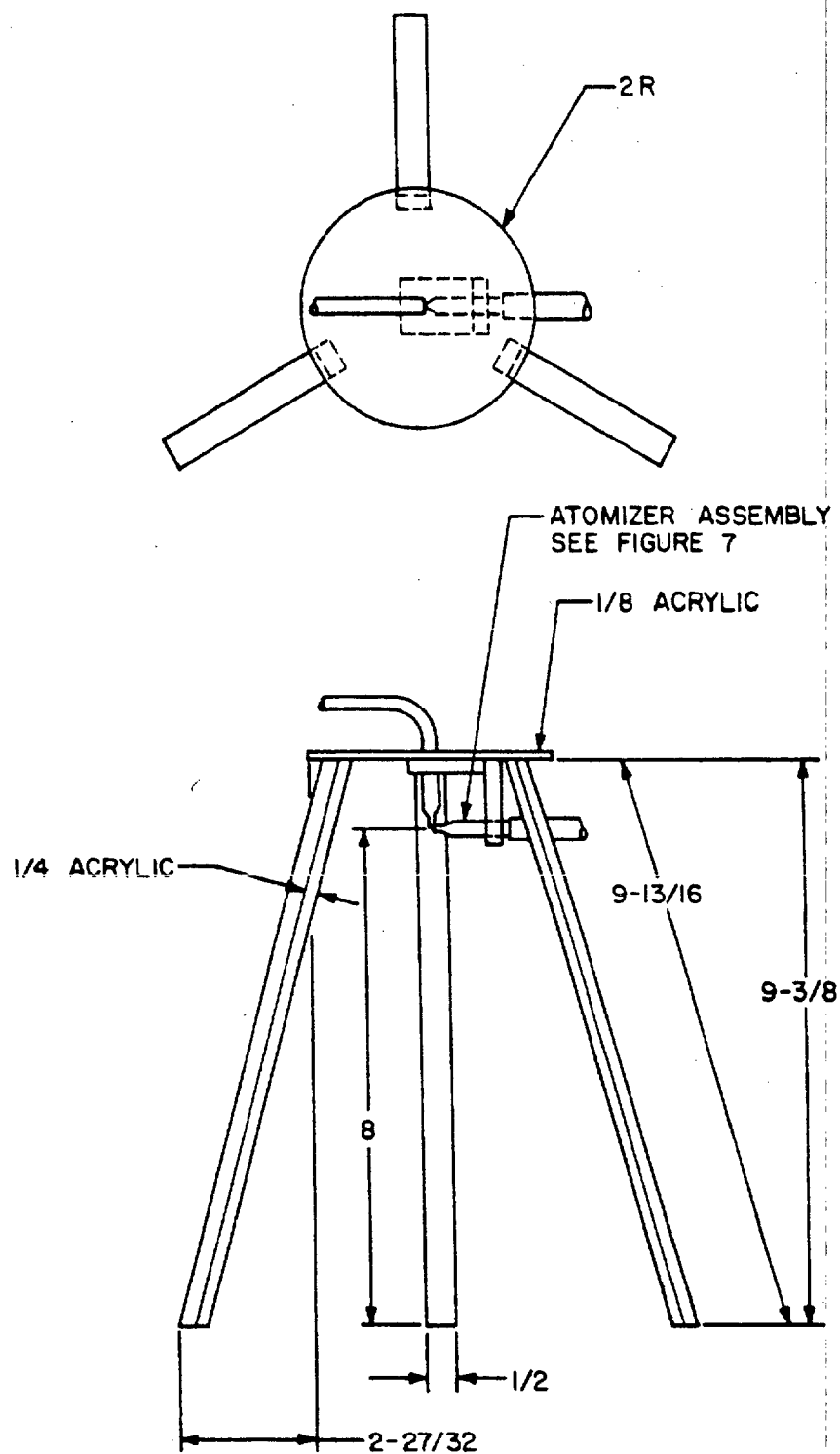
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DIMENSIONS ARE IN INCHES

FIGURE 7. Acrylic turntable detail.

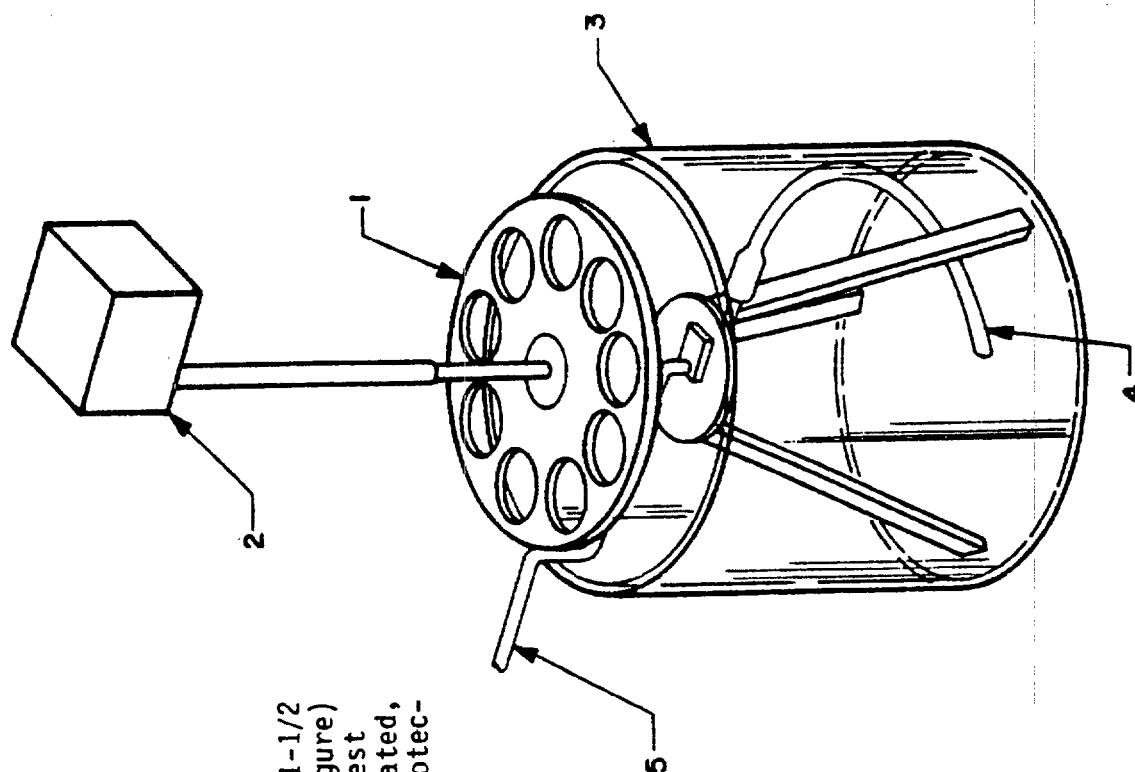
MIL-C-85054A(AS)



DIMENSIONS ARE IN INCHES

FIGURE 8. Atomizer support assembly.

MIL-C-85054A(AS)



LEGEND

1. Acrylic Turntable, positioned with the lower surface 1-1/2 inches above the jar rim. The turntable (see Figure) is provided with holes for the mounting of the test disk holders. The turntable is mechanically rotated, driven by the electric motor (2) encased in a protective acrylic box, mounted above the jar.
2. Electric Drive Motor
3. Jar, 12 inches diameter, 12 inches high
4. Liquid Pickup Tube
5. Compressed Air Inlet, 12 psi, 1 ft.³/min.
6. Acrylic Atomizer Support - See Figure 8
7. Atomizer Assembly - See Figure 8

FIGURE 9. Synthetic sea water - sulfurous acid spray test apparatus.

MIL-C-85054A(AS)

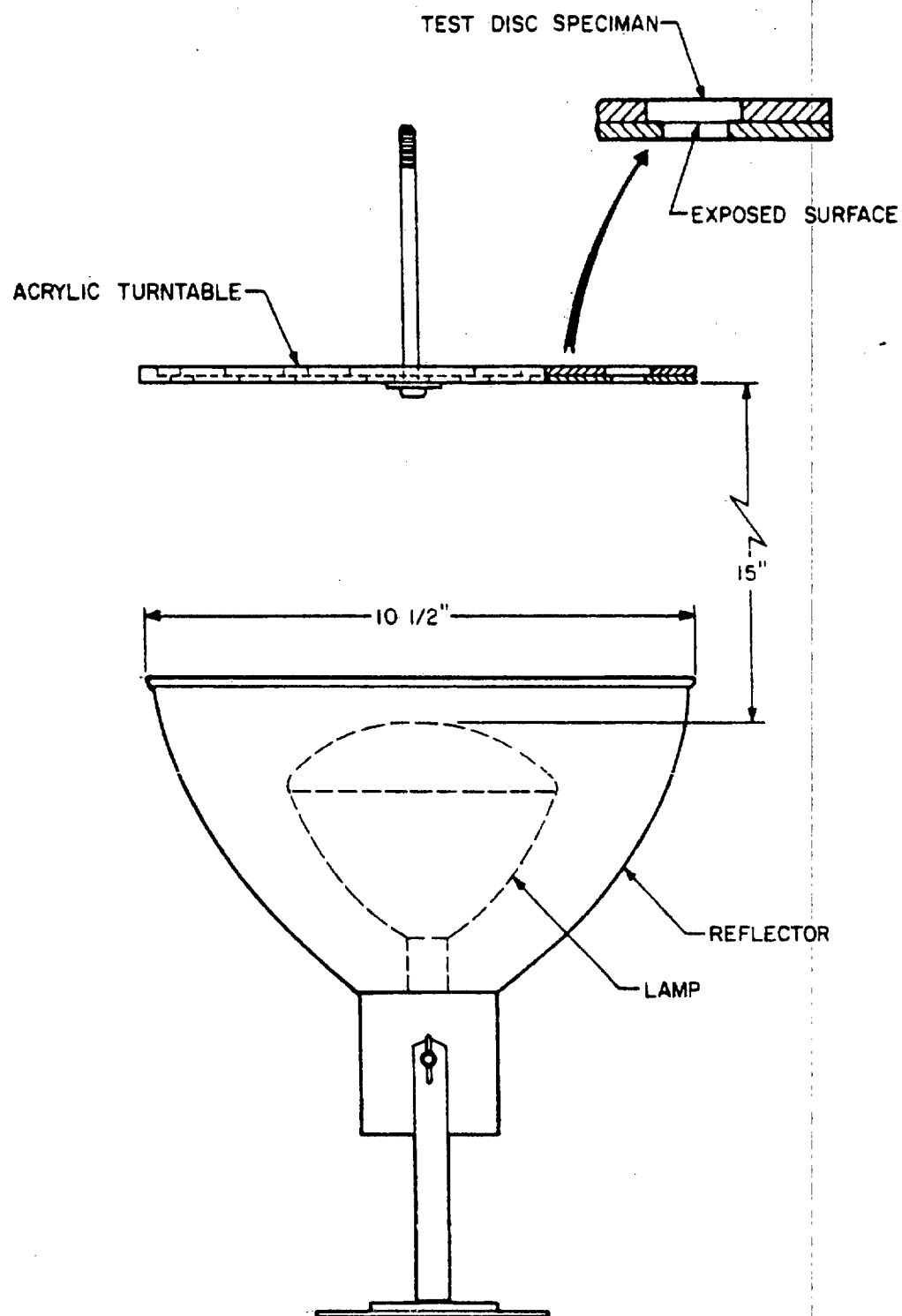


FIGURE 10. Ultraviolet sunlamp exposure.

MIL-C-85054A(AS)

3.3 Solvent content. The solvent content of the compound shall consist of a nonphotochemically reactive solvent blend. A non-photochemically reactive solvent is any solvent with an aggregate of less than 20 percent of its total volume composed of the chemical compounds classified below or which does not exceed any of the following individual percentage composition limitations referring to the total volume of solvent:

- a. A combination of hydrocarbons, alcohols, aldehydes, esters, or ketones having an olefinic or cyclo-olefinic type of unsaturation: 5 percent.
- b. A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 3 percent.
- c. A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent.

3.3.1 Toxicological data. The supplier, when requested, shall furnish the toxicological data and the safety requirements of the material used to the Commander, Naval Air Development Center, Aircraft Crew Systems, Technology Directorate, Code 6062, Warminster, PA 18974.

3.4 Properties. The corrosion preventive compound, when tested as specified in section 4, shall conform to the applicable requirements of table II.

3.4.1 Appearance. The applied compound shall form a uniform transparent film that appears light blue when applied on a white surface.

3.5 Pressurized containers. The pressurized container shall meet the following additional requirements:

3.5.1 Leakage. The pressurized cans shall not leak or become distorted when tested as specified in 4.8.8.1.

3.5.2 Fill. Pressurized cans shall contain 11 ounces by weight of the compound when tested as specified in 4.8.8.2.

3.5.3 Performance of pressurized containers. Compound packaged in pressurized containers shall spray uniformly, adhere to the panel and shall not foam excessively or "sag" when tested as specified in 4.8.8.3.

3.6 Workmanship. The workmanship shall be in accordance with the best commercial practice covering this type of material. The ingredients shall be uniformly processed to produce the quality of product established by this specification. The finished product shall be clean and uniform and free of any defects that might impair its use, such as sediment, metal or other foreign particles in the pressurized containers, education tubes and valve assemblies. The exterior orifice of the pressurized containers shall be symmetrical and free of ragged edges and, if drilled, shall be symmetrical and in direct alignment with angle of discharge.

MIL-C-85054A(AS)

TABLE II. Properties.

Property	Requirement	Test procedure
Dryness	0.0100g (max)	4.8.1
Synthetic sea water-sulfurous acid spray	No visible corrosion on carbon steel after 10 cycles	4.8.2
Synthetic sea water displacement	No visible corrosion	4.8.3
Abrasives	None present	4.8.4
Sprayability	Sprayable	4.8.5
Corrosivity	No visible pitting, etching, or dark discoloration. No weight change (milligrams/cm ²) greater than 0.5 for magnesium, cadmium and zinc nor greater than 0.2 for aluminum, copper and brass.	4.8.6
Staining	No visible evidence of staining or other deleterious effect	4.8.7
Pressurized container leakage	No leakage or distortion	4.8.8

3.7 Additional unit pack markings. In addition to those markings required in section 5, unit pack markings shall contain use, mixing, handling and precautionary markings as well as noting any protective clothing and equipment required.

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.

MIL-C-85054A(AS)

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

- a. First article inspection (4.3).
- b. Quality conformance inspection (4.4).

4.3 First article inspection. First article inspection shall include all the examinations and tests of this specification except the examinations of packaging. Unless otherwise specified, no material shall be submitted for acceptance under any contract or order until the first article samples prescribed in 4.3.1 have been subjected to first article inspection and pronounced satisfactory by the Naval Air Development Center. Approval of the first article samples shall not relieve the supplier of his obligation to meet the quality conformance inspection (4.4.).

4.3.1 First article test samples. Samples for first article inspection shall consist of at least five 16 ounce (fluid ounces) gas pressurized cans of the compound, five quarts of the compound exclusive of propellants, and three ounces of each ingredient to determine conformance to table I. Samples shall be selected at random from materials which have been manufactured or used for filling the contract. (Pressurized containers not required when only quarts are procured.) Samples shall be forwarded to the Commander, Naval Air Development Center, Aircraft and Crew Systems, Technology Directorate, Code 6062, Warminster, PA 18974. Samples shall be plainly identified by securely attached durable tags marked with the following information:

CORROSION PREVENTIVE COMPOUND, WATER
DISPLACING, CLEAR
Samples of material subjected to first article
Name of Manufacturer (Plant in which material is
manufactured)
Manufacturer's Designation
Date of Manufacture
Submitted by (Name) (Date) for Contract No. _____

The manufacturer shall submit a copy of test results with the samples showing conformance with all the requirements of this specification and the applicable requirements of the Department of Transportation. The manufacturer shall submit a certified statement specifically identifying each ingredient in the compound by chemical name, source and percentage of weight. The manufacturer shall include data on the percent by weight and the composition of the propellant furnished in type I containers. For initial first article test sample submittals, one copy of the Material Safety Data Sheet shall accompany the samples being submitted for test (see 3.2.5, 3.3.1 and 6.2).

4.3.2 Data to accompany test samples. Two copies of the manufacturer's test report shall be submitted simultaneously with the samples of 4.3.1. The report shall contain numerical test data, where applicable, showing that the material submitted for the first article inspection conforms

MIL-C-85054A(AS)

to the requirements of this specification. In addition, two copies of the manufacturer's instructions for the application of the compound shall accompany the report.

4.3.3 First article sample and inspection for a subsequent contract. If a contractor has previously furnished the compound in accordance with the requirement of this specification and his product has been found to be satisfactory, the requirement for a first article sample and its submittal for any subsequent contract or order may be waived at the discretion of the Naval Air Development Center.

4.3.4 Rejection. Failure in any first article inspection test shall result in rejection of the material. Initial rejection shall require correction of defects by the manufacturer and resubmission of a first article inspection sample as specified in 4.3.1. A second rejection may be cause for cancellation of the contract.

4.4 Quality conformance inspection. Quality conformance inspection shall consist of examinations listed in 4.5.2 and the following tests:

Dryness (see 4.8.1)
Synthetic sea water displacement (see 4.8.3)
Sprayability (see 4.8.5)
Fill (see 4.8.8.2)

4.4.1 Certification. The manufacturer shall certify that there has been no formulation or process change from that which resulted in the production of the first article inspection sample. Each ingredient material shall be identified with the name of its manufacturer and that manufacturer's trade name and formula number.

4.5 Inspection sampling. Sampling for inspection shall be in accordance with MIL-STD-105, except where otherwise indicated herein.

4.5.1 Inspection lot. An inspection lot shall consist of all material produced during a single batch operation and offered for acceptance at one time.

4.5.2 Examination of product.

4.5.2.1 Sampling for visual inspection. A random sample of filled containers shall be selected from each inspection lot in accordance with MIL-STD-105 at Inspection Level I and an AQL of 2.5 percent defective to verify conformance to all requirements of this specification regarding material (3.2).

4.5.2.2 Inspection of packaging. The preservation, packing and marking of the compound shall be inspected to determine conformance to the requirements of section 5 of this specification. Inspection Level shall be S-2 and the AQL shall be 2.5 percent defects per 100 units. Sample unit for

this examination shall be a full shipping container. Containers used for this examination shall be the same as those selected for visual inspection and samples for tests.

4.5.2.3 Samples for test. Samples shall be selected in accordance with MIL-STD-105, Inspection Level S-3 with an AQL of 4.0 percent defective. The sample unit shall be one 11 (plus propellant) ounce gas pressurized container and one quart of the compound from which these samples were filled, exclusive of the propellant.

4.6 Test conditions. In general, physical tests contained in this specification shall be made under controlled atmospheric conditions having a relative humidity of 50 ± 5 percent and a temperature range of from 70° to 80°F. Waiver of this requirement may be permitted where proper conditioning facilities are not available for control testing. However, for referee purposes, the specified tests shall be made upon the compound under the specified atmospheric conditions.

4.7 Test disks and panels (except for corrosivity and staining).

4.7.1 Materials. The material for the test disks and panels shall be carbon steel conforming to FS 1020 of MIL-S-7952.

4.7.2 Size of test disks and panels. Test panels for tests requiring compound coatings shall be 2 by 4 by 1/8 inches except for the synthetic sea water-sulfurous acid spray and dryness tests when disks with a diameter of 2-1/8 inches and a thickness of 1/16 inch shall be used.

4.7.3 Preparation of test panels and disks. Panels and disks shall have all sharp edges and burrs removed and shall have all holes chamfered to prevent injury in handling. The panels and disks shall be surface ground and hand polished with a 240 grit silicon carbide or aluminum oxide cloth or paper to produce a surface finish of 10 to 20 microinches (rms). Iron oxide or "wet or dry" papers or cloths shall not be used.

4.7.4 Cleaning of test panels and disks. The utensils and cloths used in the cleaning of test panels and disks shall be clean and free of contamination. Solvents shall be fresh and renewed frequently. In all stages of treatment the handling of panels and disks with the bare hands shall be avoided. The panels and disks shall not be permitted to contact contaminated surfaces during the cleaning procedure and shall be handled by tongs and hooks during and after dipping. After polishing, they shall be cleaned with a surgical gauze swab in a beaker of hot mineral spirits conforming to grade I of TT-T-291. Cleaning and scrubbing shall be followed by dipping in (1) a second container of hot mineral spirits, (2) boiling 95 percent methanol and (3) boiling absolute methanol. The panels and disks shall be allowed to dry and shall then be stored in a desiccator until ready for use. If storage of more than 24 hours occurs, the surface preparation shall be repeated starting with the hand polishing.

MIL-C-85054A(AS)

4.7.5 Coating of the test disks. Application of the compound to the test disks shall be carried out under the atmospheric conditions of 4.6. The disks shall be held at an angle of 30° from the horizontal. A coating of the compound shall be sprayed on the disks from a pressurized container or a container conforming to MIL-S-22805 held 12 inches away. After ten minutes a second coating is sprayed on. The combined thickness of the two coats after drying shall be 1.2 - 1.5 mils. After application they shall be conditioned for 24 hours under the atmospheric conditions of 4.6 in a draft, dust and fume free atmosphere.

4.8 Test methods.

4.8.1 Dryness. Three test disks prepared as specified in 4.7.3 shall be cleaned as specified in 4.7.4, coated as in 4.7.5, using compound conditioned as in 4.8.2.1.2 and allowed to hang in a vertical position for two hours. They shall then be weighed and completely immersed vertically in talcum powder and withdrawn immediately. They shall then be reweighed to the nearest 0.0001 gram. The average change in weight shall be recorded. This procedure shall be repeated with test panels which have not been coated. These shall be used as controls. The average weight increase of the coated panels as compared with the weight increase of the uncoated panels shall be the measure of dryness.

4.8.2 Synthetic sea water-sulfurous acid spray test.

4.8.2.1 Materials.

4.8.2.1.1 Test solution. The spray test solution shall consist of a solution made by adding 2 milliliters of the sulfurous acid (6.4% assay as SO_2) to each liter of synthetic sea water. The pH shall be measured and shall be between 3.3 and 3.5. If it does not, additional acid or synthetic sea water must be added to adjust the pH to this range. The synthetic sea water shall be prepared by adding 50 grams of sodium chloride (NaCl); 22 grams of magnesium chlorida ($\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$), 3.2 grams of calcium chloride ($\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$) and 8.0 grams of sodium sulfate (Na_2SO_4) to a liter of distilled or demineralized water. One liter of fresh test solution shall be used for each cycle.

4.8.2.1.2 Conditioning of compound sample. A container of the compound shall be exposed to the following cycle four times without physical disturbance of the compound:

Eight hours at $130 \pm 2^\circ\text{F}$
Sixteen hours at $-40 \pm 2^\circ\text{F}$

At the end of this cyclic exposure the contents of the sealed container shall be allowed to remain at $75 \pm 5^\circ\text{F}$ for 24 hours.

4.8.2.1.3 Apparatus. The apparatus used in this test should conform to Figures 6 through 10. The apparatus may be combined in one cabinet and made fully automatic or may be manually operated as two separate units.

MIL-C-85054A(AS)

4.8.2.1.4 Procedure. Test disks prepared as specified in 4.7.3 shall be cleaned as specified in 4.7.4, coated as specified in 4.7.5, using compound conditioned as in 4.8.2.1.2 allowed to dry overnight in a horizontal position on a level surface and shall then be placed in the disk holders. The disk holders shall be placed in the turntable and the turntable started. The air, regulated to a flow of one \pm 0.1 cubic foot per minute, shall be supplied to the nozzle to effect the spray. The spray shall continue for one hour at which time the spray is shut off, and the disk holders containing the test disks shall be moved to a position over the 275 watt ultra violet sunlamp. The lamp shall be then turned on for three hours. The combination of one hour spray and three hours exposure to the ultra violet lamp shall be defined as one cycle. At the completion of the ten cycles, the disks shall be cleaned in mineral spirits conforming to grade 1 of TT-T-291 after which they shall be examined for any visible corrosion, pitting or staining under 10X magnification.

4.8.3 Synthetic sea water displacement.

4.8.3.1 Procedure. Panels prepared as in 4.7.3 and 4.7.4 shall be placed so that one 2-inch end shall be raised one inch above a horizontal surface. The panels shall then be sprayed with the synthetic sea water of 4.8.2.1.1 so that the entire upper surface of the specimen is covered with tiny droplets. Within one minute after spraying, one milliliter of the test compound shall be poured along the upper two-inch edge of the panels and allowed to run slowly down the specimen so as to completely cover the test panel. After another minute, a second milliliter of the test compound shall be poured and allowed to run down the panels in a like manner. After waiting an additional minute, the panels shall be picked up and held in a vertical position for one minute and shall then be placed flat (test side up) above distilled water at 72°F in a closed desiccator. After 4 hours they shall be removed and cleaned with mineral spirits, and then evaluated for presence of visible corrosion.

4.8.4 Abrasives. Mix approximately 75 milliliters of the compound with 200 milliliters of xylene and stir until all soluble matter is in solution. Allow to stand for one hour at room temperature to permit any insoluble matter to settle. Carefully decant, wash the residue with 100 milliliters of xylene and again carefully decant. Repeat the procedure with successively smaller portions of xylene until the solution is practically colorless. The residue after the last decantation shall be rubbed between two pieces of flat clean glass plate. The appearance of scratches on the glass plate shall be considered evidence of the presence of abrasive material.

4.8.5 Sprayability.

4.8.5.1 Pressurized container. A filled pressurized container shall be cooled to 0°F and held at that temperature for 3 hours then stored at 40°F for 20 hours. Immediately after conditioning, shake vigorously for 15 seconds and spray the material for 30 seconds. The material shall be considered as having passed the test if it can be satisfactorily sprayed.

MIL-C-85054A(AS)

4.8.6 Corrosivity.

4.8.6.1 Preparation of specimens. Specimens of the following metals shall be used in this test:

Magnesium, QQ-M-44
Cadmium, QQ-A-671
Zinc, MIL-A-18001
Aluminum, QQ-A-250/4
Copper, QQ-C-576
Brass, QQ-B-626

Suggested specimen size is 3 x 1/2 x 1/16 inches.

4.8.6.2 Test procedure. Three specimens of each of the above metals shall be polished to remove pits, burrs and irregularities from all faces and edges. The panels shall be finished and cleaned as specified in 4.7.3 and 4.7.4. After weighing, the specimens shall be coated as in 4.7.5. After a one hour drying period, the specimens shall be placed in a chamber maintained at $130^{\circ} \pm 2^{\circ}\text{F}$ and 75% R.H. for seven days. Upon completion, the coating and any loose corrosion products shall be removed by cleaning in acetone. Reweigh the specimens and calculate the weight loss or gain in milligrams per square centimeter.

4.8.7 Staining.

4.8.7.1 Preparation of test panel. A test panel measuring 3 by 6 by 0.020 inches shall be fabricated from aluminum alloy conforming to QQ-A-250/5. The panel surface shall be prepared as follows: spray one coat of wash primer, conforming to MIL-C-8514, to a dry film thickness of 0.0002 to 0.0003 inch and air dry for 30 minutes. One coat of lacquer primer, conforming to MIL-P-7962, shall be sprayed over the wash primer to a dry film thickness of 0.0003 to 0.0004 inch and air dried for 30 minutes. Two coats of acrylic nitrocellulose insignia white lacquer, conforming to MIL-L-19537, shall be sprayed over the preceding films, allowing a 30-minute drying time between coats. The panel shall be permitted to dry at least 24 hours in a clean dust-free atmosphere before performance of test.

4.8.7.2 Test procedure. Half of the panel shall be coated as in 4.7.5. The panel shall be placed under a 275 watt ultra-violet R.S. sunlamp. The center of the sunlamp shall be positioned 15 inches from the center of a 14 inch diameter turntable which shall revolve at an approximate rate of 3 rpm. The test shall be conducted at $75 \pm 5^{\circ}\text{F}$. A constant line voltage to the lamp shall be maintained so that a direct scale reading of 20 units is obtained on a General Electric sunlamp tester No. 113 or its equivalent, used without shield. After a 72-hour exposure period, the panel shall be cleaned with paint thinner, TT-T-291, applied with a clean gauze swab and the panel surface examined for stain. Evidence of stain in one or more areas shall be cause for rejection.

4.8.8 Specialized tests for pressurized containers.

MIL-C-85054A(AS).

4.8.8.1 Leakage. The pressurized container shall be completely submerged for five minutes in water maintained at a minimum of $130 \pm 2^\circ\text{F}$ during which it shall be observed for the emission of bubbles. Distortion of the container or the emission of bubbles from any part of the container shall be considered evidence of leakage.

4.8.8.2 Fill. A sample can shall be weighed and then shall be sprayed at three minute periods with one minute intervals until the can is exhausted. The container shall be reweighed, and the net difference determined. The net weight of the compound shall be computed by multiplying the net difference by the fraction of the contents which has been identified in 4.3.1 as compound.

4.8.8.3 Performance of pressurized containers. Panels as described in 4.7.2 shall be used. A panel shall be supported such that the longer dimension forms a 45° angle with the horizontal. Corrosion preventive compound packaged in accordance with 5.1 shall be sprayed on the panel from a distance of 12 inches. The panel shall be examined for uniformity of spray, foaming and adherence to the substrate. After a 10 second pause the same panel shall be resprayed and examined for adhesion and sagging. After a five second pause the same panel shall be resprayed again and likewise examined.

4.9 Submission of Material Safety Data Sheets. The contractor shall furnish to the contracting activity the toxicological data and formulations required to evaluate the safety of the material for the proposed use through the submission of the Material Safety Data Sheet detailed in FED-STD-313 (see 3.2.5).

4.10 Packaging inspection.

4.10.1 Examination of packaging and marking. An examination shall be made to determine that packaging, packing and marking comply with the requirements of section 5 of this specification. Defects shall be scored in accordance with the list below. The sample unit for this examination shall be one shipping container fully prepared for delivery except that it shall not be palletized and need not be sealed. Shipping containers fully prepared for delivery that have not been palletized shall be examined for defects of closure. The lot size shall be the number of shipping containers in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-2 and acceptable quality level (AQL) 4.0 defects per hundred units.

<u>Examine</u>	<u>Defect</u>
Packaging	Container not as specified, closures not accomplished by specified or required methods or materials. Leakage or seepage of contents. Non-conforming component, component missing, damaged or otherwise defective. Bulged or distorted container.
Markings	Data, including directions for use, omitted, illegible, incorrect, incomplete, or not in accordance with contract requirements.

MIL-C-85054A(AS)

4.10.2 Examination for palletization. An examination shall be made to determine that palletization complies with the requirements of section 5 of this specification. Defects shall be scored in accordance with the list below. The sample unit shall be one palletized unit load fully prepared for delivery. The lot size shall be the number of palletized unit loads in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-1 and acceptable quality level (AQL) 6.5 defects per hundred units.

<u>Examine</u>	<u>Defect</u>
Finished dimension	Length, width or height exceeds specified maximum requirement.
Palletization	Not as specified. Pallet pattern not as specified. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted, incorrect, illegible, of improper size, location, sequence or method of application.

5. PACKAGING

5.1 Preservation and unit packing. Preservation and unit packing shall be level B or Commercial as specified in the contract in accordance with MIL-STD-290 (see 6.2). Pressurized containers shall conform to type IX, class 2 of PPP-C-96 with a valve opening diameter suitable for the valve necessary for proper dispensing. Nonpressurized containers shall conform to PPP-C-96. Neither the container nor any component thereof (closure, lining, etc.), shall interact with or alter the contents in any way so as to adversely affect their purity or quality.

5.2 Packing. Packing shall be level B or Commercial in accordance with MIL-STD-290 as specified in the contract or order (see 6.2).

5.3 Marking. Marking of the containers shall be in accordance with MIL-STD-290, except as specified herein. Marking shall be legible, shall be accomplished by lithographing or silkscreen process and shall be white on an orange label or as specified in the contract. Paper coated labels on pressurized containers are not acceptable; any special marking specified in the contract or order shall also be included. In addition, the following information shall be included on each gas pressurized container and quart container as applicable (when not already required by MIL-STD-290 or the contract or order):

MIL-C-85054A(AS)

Front Face:

(Stock No.)
 CORROSION PREVENTIVE COMPOUND,
 WATER DISPLACING, CLEAR (AMLGUARD)
 MIL-C-85054A(AS)
 Lot _____ Date Mfg _____
 (Contract No.)
 (Manufacturer's Name)
 (Manufacturer's Address)
 (Manufacturer's Product No.)
 (Net wt) (Includes _____% by weight of propellant _____)

Important! For best results follow instructions on reverse side of container.

USES

This material will displace salt water and moisture leaving a clear, corrosion preventive film. It is intended for use on areas which are unpainted metal, where the paint has cracked or been damaged such as: around fasteners, seams, access panels, etc. It is not intended for use on moving parts which require a lubricated surface.

Instructions - For best results

1. Wipe off dirt and excess moisture from surface to be protected prior to applying the corrosion preventive compound.
2. Apply a thin uniform coat of corrosion preventive compound directly on area to be protected.
3. Allow to dry for one half hour.
4. Apply a second uniform coat of corrosion preventive compound.
5. Application by wiping is not recommended. Reapplication of compound is necessary after solvent cleaning or where coating has been damaged by abrasion.

NOTE: May be removed with methyl ethyl ketone TT-M-261 or aliphatic naptha TT-N-95.

CAUTION (for spray cans)

Contents pressurized. Do not puncture, incinerate or store above 120°F. Do not place can near open flame or other heat source. Use with adequate ventilation and avoid breathing spray. Harmful if swallowed. Shake before using.

MIL-C-85054A(AS)

5.4 Palletization. When specified, unit packs of corrosion preventive compound packed as specified in 5.2 will be palletized in accordance with MIL-STD-290 (see 6.2).

6. NOTES

6.1 Intended use. The corrosion preventive compound covered by this specification is used on any metal surfaces. It is primarily intended for in-service treatment. It should not be used around liquid oxygen fittings. The ability of this material to prevent corrosion, to displace water, and its ease of application from pressurized spray cans make it particularly suited for service use. This compound is intended for use in non-moving parts not requiring a lubricated surface, such as fasteners, seams, access panels, joints, unpainted metal and where paint is cracked or damaged.

6.2 Ordering data. Requests, requisitions, schedules and contracts or orders should specify the following:

- a. Title, number and date of this specification.
- b. Type.
- c. Quantity (specify number of cans).
- d. Packaging desired (see 5.1).
- e. Level of packing required (see 5.2).
- f. Labeling or other special marking required (see 5.3).
- g. Items of data required (see 6.3).
- h. Specify if palletization is required.
- i. Specify that FAR clauses 23.303 and 52.223-3 are invoked.
- j. Addresses for submission of MSDSs (see 3.2.5, 4.3.1).

6.2.1 Contract provision. Contracts shall specify the following provision for first article inspection.

6.2.1.1 First article. When a first article is required for inspection and approval (see 3.1, 4.3, 6.2 and 6.3), the contract shall specify the following provision for first article inspection. When a contractor is in continuous production of the compound from contract to contract, consideration should be given to waive the first article inspections. If inspection is required, indicate:

- a. If first article inspections are conducted at the contractor's plant or a government approved laboratory, an inspection report shall be forwarded to the procuring activity for verification.

- b. That the approval of first article samples or the waiving of the first article inspection shall not relieve the contractor of his obligation to fulfill all other requirements of the specification and contract.

6.3 Contract data requirements. When this specification is used in a procurement which incorporates a DD Form 1423 and invokes the provisions of 7-104.9(n) of the Armed Services Procurement Regulations, the data requirements identified below will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of ASPR-7-104.9(n) are not invoked, the data specified below will be delivered by the contractor in accordance with the contract requirements. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph	Data Requirement	Applicable DID
4.3	First Article Inspection Reports	DD-T-5329 - Inspection Test Reports
4.4	Quality Conformance Inspection Reports	DD-T-5329 - Inspection Test Reports

DD Form 1426 should state in block 16 "delete the word equipment."

(Copies of data item descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

6.4 Ingredients. The ingredients of table III which, when properly processed, have produced a preventive compound meeting the requirements of this specification. The list of approved proprietary raw materials is not to be construed as an endorsement thereof or as precluding similar materials from other proprietary sources. Such products may prove equivalent or even superior in performance to the ones listed.

6.5 Samples shall be furnished at no cost to the Government and the manufacturer shall pay the transportation charges to and from the designated point where tests are to be made. In the case of failure of the sample or samples submitted, consideration will be given to the request of the manufacturer for additional tests only after it has been clearly shown that changes have been made in the product which the Government considers sufficient to warrant additional tests, and a new designation is given the material by the manufacturer.

6.6 Section 173.306 of the Interstate Commerce Commission Regulations specifies that each completed metal container filled for shipment must be heated until the contents reaches a minimum temperature of 130°F without evidence of leakage, distortion or other defects.

MIL-C-85054A(AS)

TABLE III. Ingredients.

Ingredients	Trade Name	Source
a. Isopropanol	Isopropanol TT-T-735	AMSCO Division of Union Oil Company of Cal., 3100 South Meacham Road, Palatine, IL 60067
b. Aromatic hydrocarbon	Amsco solvent G	AMSCO Division of Union Oil Company of Cal., 3100 South Meacham Road, Palatine, IL 60067
c. Barium petroleum sulfonate	NaSUL BSN	R. T. Vanderbilt Company, Inc., 30 Windfield Street, Norwalk, CT 06855
d. Alkyl Ammonium organic phosphate	Rust Preventive #2	E. I. DuPont de Nemours and Company, Inc., Petroleum Chemical Division, Wynwood, PA
e. Silicone resin	SR-80	General Electric, Silicon Product Division, Waterford, NY 12188
f. Silicone Alkyd resin	Varkyd 385-50E	McCloskey Varnish, 7600 State Road, Philadelphia, PA 19101
g. Trichlorotri-fluoroethane	Freon TF	
h. Solvent Blue 36	Oil Blue A Organic Dye	E. I. DuPont de Nemours and Company, Petroleum Chemical Division, Wilmington, DE 19898

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - AS
Project No. 8030-N085

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (**DO NOT STAPLE**), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)***1. DOCUMENT NUMBER**
MIL-C-85054A(AS)**2. DOCUMENT TITLE**
Corrosion Preventive Compound, Water Displacing, Clear (AMLGUAR)**3a. NAME OF SUBMITTING ORGANIZATION****4. TYPE OF ORGANIZATION (Mark one)**☐ **VENDOR**☐ **USER**☐ **MANUFACTURER**☐ **OTHER (Specify):** _____**b. ADDRESS (Street, City, State, ZIP Code)****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 (Include Area Code) - Optional****c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional****8. DATE OF SUBMISSION (YYMMDD)**