

METRIC

MIL-L-24479C(SH)
12 December 1990
SUPERSEDING
MIL-L-24479B(SH)
26 August 1981

MILITARY SPECIFICATION

LUBRICANT, RED LEAD AND GRAPHITE IN MINERAL OIL

This specification is approved for use by the Naval Sea 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 requirements for a lubricant consisting of red lead, graphite, and mineral oil, intended for use with metal parts having limited clearances and in applications where control of impurities is required.

2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto cited in the solicitation.

SPECIFICATIONS

FEDERAL

SS-G-659 - Graphite, Dry (Lubricating).
PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials, Packaging, Packing, and Marking of.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, D.C. 20362-5101 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 9150

DISTRIBUTION STATEMENT A: Approved for public release;

MIL-L-24479C(SH)

MILITARY

MIL-H-17672 - Hydraulic Fluid, Petroleum, Inhibited.
MIL-I-45208 - Inspection System Requirements.

(Unless otherwise specified, copies of federal and military specifications, standards, and handbooks are available from the Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

- * 2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. The issue of documents not listed in the DODISS are the issues of the documents cited in the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- * ASTM D 83 Red Lead Pigment

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained."

3. REQUIREMENTS

3.1 General requirements

- * 3.1.1 Materials. The lubricant shall consist of red lead dry pigment in conformance with ASTM D83, 97% grade, graphite in conformance with the requirements of SS-G-659, and mineral oil in conformance with the requirements of MIL-H-17672 (Military Symbol 2135T-H).

MIL-L-24479C(SH)

- * 3.1.2 Containers. The containers and caps for the lubricant shall be either nonhalogenated plastic or seamless uncoated tinned metal and shall be unaffected by their contents. The containers shall be leaktight and unbreakable. The container materials in contact with the mixed lubricant shall be sufficiently inert, corrosion-resistant, and sufficiently free of contaminants that the contents will be unaffected.

3.1.3 Marking and labeling. The legend on each container may be printed on or be on an affixed label. The legend shall be capable of being cleaned of smeared lubricant by using acetone, denatured alcohol, isopropanol, or trichlorotrifluoroethane. It shall be of such quality that it will withstand normal handling, use, and cleaning specified without obliteration or loss.

- * 3.2 Premixed lubricant. This shall be provided as a mixture of the three ingredients in a container ready for use.

3.2.1 Premixed lubricant. The lubricant in each container shall consist of 285 ± 5 grams (g) of the mixture of the three ingredients. The mixture shall have a smooth, uniform consistency, without lumps.

3.2.2 Proportions of ingredients. The ingredients for the lubricant mixture shall be in the following proportions: for each 22 g of red lead, add 6 g of graphite and 10 milliliters (mL) of mineral oil.

3.2.3 Container. Lubricant containers shall have a capacity of 250 cubic centimeters (cm^3) or eight fluid ounce, and shall be of the "wide-mouth type" with a screw cap and integral brush applicator. The applicator shall be a bristle brush 5/16-3/8 inch wide and 5/8-3/4 inch long attached to a stem and firmly fixed to the screw cap and extending to within 1/4 inch of the bottom of the container. The stem material shall meet the requirements as specified in 3.1.2.

3.2.4 Legend. The legend on the containers shall be in black letters against a light green background and shall contain the following:

MIL-L-24479C(SH)

3.2.4.1 Identification.WARNING - FLAMMABLE

Lubricant
RED LEAD AND GRAPHITE IN MINERAL OIL
(MIL-L-24479)

National Stock No. _____

KEEP CONTAINER CLOSED WHEN NOT IN USE.

Date Manufactured _____

Batch Nos.: Red Lead _____

Graphite _____

Mineral Oil _____

Lot No. _____ Net Weight _____

(Vendor Name and Address)

3.2.4.2 Instructions.INSTRUCTIONS/PRECAUTIONS

1. Prevent contamination of surrounding surfaces and weld preparation areas. Shield or mask as required.
2. If oil separation in the lubricant is observed, stir until a smooth, uniform blend is obtained.
3. Apply sparingly to the surface. Coverage shall appear as a thin, rust-colored, uniform, greasy film.
4. After usage of lubricant and installation of fastener, inspect the surrounding areas for contamination. Remove lubricant found as follows:

*

- (a) Clean area with acetone, denatured alcohol, or isopropanol and wipe dry.
- (b) Visually inspect and if necessary, mechanically clean the surface by brushing with a clean, corrosion-resistant steel brush.
- (c) Repeat step (a) if mechanical cleaning is performed.

3.2.4.3 Lettering shall be clearly legible and proportional to the available space of the container. The words "Red Lead and

MIL-L-24479C(SH)

Graphite in Mineral Oil," "Keep Container Closed When Not in Use," and "Instructions/Precautions" shall be in letters smaller than those in "WARNING - FLAMMABLE" and larger than the other letters.

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 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material."

4.1.2 Inspection system. The supplier shall provide and maintain an inspection system acceptable to the Government for supplies and services covered by this specification. The inspection system shall be in accordance with MIL-I-45208.

4.1.3 Certification of quality conformance. A certification of quality conformance shall be furnished to the procuring agency or Command with each lot of material offered for acceptance. The certification shall include actual results of specified test, general information for identification of the samples and ingredients, and certification that the batches of ingredients used conform to specification requirements.

4.1.3.1 The minimum certification data required shall be as listed on figure 1, the Certificate of Quality Conformance, and may be submitted in the format shown on figure 1.

MIL-L-24479C(SH)

4.2 Quality conformance.4.2.1 Definitions.

4.2.1.1 Batch. A batch of ingredient shall consist of a quantity of material produced at one time for use in the final product and identified by a designation characteristic of the one batch.

- * 4.2.1.2 Lot. A lot of finished product shall consist of all containers of premixed lubricant manufactured using the same combination of batches of ingredients and shall be identified by a designation characteristic of the one lot. Lots of lubricant manufactured from the same combination of batches of ingredients shall be assigned different designations.

4.1.2.3 Samples. Samples taken shall be from the final product in the marked approved containers as specified in 3.2.3. The final product shall be held in the containers for at least 48 hours and then mixed thoroughly before samples are taken for test.

4.2.2 Quality conformance inspection.

- * 4.2.2.1 Sample size. Two containers from each lot of premixed lubricant shall be selected at random and inspected as specified in 4.2.2.1.1 through 4.2.2.1.4.

4.2.2.1.1 Container content and leakage. The containers shall meet the requirements for weight as specified in 3.2.1 using an identical unfilled container as a tare weight and the requirements of PPP-P-1892 for "Leakage".

4.2.2.1.2 Ingredient verification. The three ingredients shall be verified to meet the requirements as specified 3.1.1 by ensuring certifications for the batches of ingredient are provided and by examining records kept in accordance with MIL-I-45208.

4.2.2.1.3 Ingredient proportion verification. Total oil content of samples taken from the two containers shall be determined using the following procedure and shall meet the acceptance criteria specified.

A. Procedure.

1. Stir lubricant in the container until a smooth, uniform blend is obtained and then immediately transfer 1-2 g of lubricant into a weighed

MIL-L-24479C(SH)

- 40-50 mL centrifuge tube. Deposit the sample as low as possible in the tube and wipe out any lubricant smeared on the top inch of the inner tube wall.
2. Reweigh the centrifuge tube and sample to the nearest milligram and determine weight of the sample.
 3. Add 10-20 mL of Freon-113 ($\text{CFC}_{12}-\text{CF}_2\text{Cl}$) to the tube and mix with the sample as thoroughly as possible, using a steel microspatula. (Avoid inhalation of the Freon-113.)
 4. Allow the contents to settle for two hours or centrifuge at approximately 1,800 revolutions per minute r/min for five minutes.
 5. Decant the clear liquid carefully through a funnel containing a 9 centimeters (cm) S and S red ribbon (or Whatman No. 41) filter paper into a weighted 20 or 30 mL glass beaker.
 6. Evaporate the Freon under a heat lamp in a current of clean, dry air. (Maintain the sample beaker temperature less than 60°C .)
 7. Repeat Steps 3 - 6 two more times.
 8. Reweigh the beaker and extract. Determine the extract weight.
 9. Calculate the percent by weight of the oil content i. the sample using the following expression.

$$\text{Total oil (weight percent)} = \frac{\text{g of extract}}{\text{g of sample}} \times 100$$

- B. Acceptance criteria. The total oil content shall be 24.0 ± 1.0 weight percent.

4.2.2.1.4 Legend verification. The legend on the containers shall be verified to meet the requirements as specified in 3.2.4.

5. PREPARATION FOR DELIVERY

5.1 Subcontracted materials. The preparation for delivery requirements of referenced specifications do not apply to materials packaged in accordance with the requirements of this specification.

5.2 Packaging, packing, and marking. The lubricant shall be packaged, packed, and marked for delivery in accordance with the level C of PPP-P-1892, unless otherwise specified (see 6.2).

MIL-L-24479C(SH)

6. NOTES

6.1 Intended use. This lubricant is intended for use on threaded fasteners and other anti-seize applications of closely fitted parts.

6.1.1 Prohibitions and precautions.

6.1.1.1 Red lead and graphite in mineral oil shall not be applied on the surface of alloys containing more than 50 percent nickel which are exposed to operating temperatures above 400 F.

6.1.1.2 Fluid systems and nickel-base alloys must be protected from contamination with this lubricant. The following precautions should be taken:

- (a) The lubricant shall not be used prior to seal welding on a closure.
- (b) The lubricant shall be prevented from contacting gaskets and gasket seating areas.
- (c) Where materials containing more than 50 percent nickel are in proximity to lubricated parts, these materials shall be protected from contact with the lubricant by application procedures, shielding, or masking.

6.1.1.3 Lubricant material to this revision of MIL-L-24479 is interchangeable with material to previous revisions.

6.2 Ordering data. Procurement documents should specify the following:

- * (a) Title, number, and date of this specification.
- (b) Packaging and packing levels, if other than level C (see 5.2).
- (c) Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).

6.3 Certification of quality conformance format (see 4.1.3). The minimum certification data required are shown on figure 1.

- * 6.4 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, 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

MIL-L-24479C(SH)

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.

Preparing Activity:
Navy - SH
(Project 9150-N815)

MIL-L-24479C(SH)

1. Manufacturer _____
2. Address _____
3. Date _____
4. Customer Name _____
5. Customer Order No. _____
6. Identification and inspection requirements. _____

* Identification and Inspection Requirements Red Lead to ASTM D83 to Fed. Spec. SS-G-659 to Mil. Spec. MIL-H-17672

I. General information		
1. Batch number (4.2.1.1)		
2. Purchase order		
3. Verification of Ingredient Con- formance to Specification (4.2.2.1.2)		
II. Premixed Lubricant	<u>Container "A"</u>	<u>Container "B"</u>
4. Lot Number (4.2.1.2)		
5. Date of Manufacture of Lubricant (4.2.1.2)		
6. Content Weight (4.2.2.1.1)		
7. Container Leakage (4.2.2.1.1)		

FIGURE 1: Sample Certificate of Quality Conformance.

MIL-L-24479C(SH)

	<u>Container "A"</u>	<u>Container "B"</u>
8. Total Oil Weight Percent (4.2.2.1.3)		
9. Legend Verifca- tion (4.2.2.1.4)		

The above tests and inspections were conducted in accordance with the applicable paragraphs of this and referenced documents. The material supplied meets the requirements of the subject specification.

Signature

Title

FIGURE 1. Sample Certificate of Quality Conformance - Cont'd

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

- 1 The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
- 2 The submitter of this form must complete blocks 4, 5, 6, and 7.
- 3 The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER

1001-1 244790 (1)

2. DOCUMENT DATE (YYMMDD)

90100

3. DOCUMENT TITLE

LUBRICANT, RED LEAD AND GRAPHITE IN MINERAL OIL

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

7. DATE SUBMITTED (YYMMDD)

(1) Commercial

(2) AUTOVON

(if applicable)

8. PREPARING ACTIVITY

a. NAME

Commander, Naval Sea Systems Command (SEA5523)

b. TELEPHONE (Include Area Code)

(1) Commercial

(703) 602-9137

(2) AUTOVON

332-9137

c. ADDRESS (Include Zip Code)

Department of the Navy

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:
Defense Quality and Standardization Office

2001-1 244790 (1) 90100