

INCH-POUND

MIL-PRF-14107D
20 October 2000

SUPERSEDING
MIL-L-14107C
31 January 1975

PERFORMANCE SPECIFICATION

LUBRICATING OIL, WEAPONS, LOW TEMPERATURE

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

1. SCOPE

1.1 Scope. This specification covers a preservative lubricating oil for aircraft and ground small arms weapons at temperatures between 0°F to -70°F (-17.8° to -56.6°C). This lubricating oil is identified by Military symbol LAW and North Atlantic Treaty Organization (NATO) Code Number O-157.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army TACOM-ARDEC, Attn: AMSTA-AR-QAW-E, Bldg 12, Picatinny Arsenal, NJ 07806-5000 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; distribution is unlimited.

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2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

O-M-232	- Methanol (Methyl Alcohol)
P-D-680	- Dry Cleaning and Degreasing Solvent
QQ-S-698	- Steel, Sheet and Strip, Low Carbon
TT-N-95	- Naphtha, Aliphatic

STANDARDS

FEDERAL

FED-STD-791	- Lubricants, Liquid Fuels, and Related Products; Methods of Testing
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(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

2.3 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B152	- Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar
ASTM D91	- Standard Test Method for Precipitation Number of Lubricating Oils
ASTM D92	- Standard Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D97	- Standard Test Method for Pour Point of Petroleum Oils

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- ASTM D445 - Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)
- ASTM D972 - Standard Test Method for Evaporation Loss of Lubricating Greases and Oils
- ASTM D974 - Standard Test Method for Acid and Base Number by Color-Indicator Titration
- ASTM D4057 - Standard Practice for Manual Sampling of Petroleum and Petroleum Products
- ASTM D4177 - Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
- ASTM E11 - Standard Specification for Wire Cloth and Sieves for Testing Purposes
- ASTM E323 - Standard Specification for Perforated-Plate Sieves for Testing Purposes

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959).

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

- SAE AMS 3217/2 Test Slabs, Acrylonitrile Butadiene (NBR-L), Low Acrylonitrile

(Application for copies should be addressed to SAE, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001).

2.4 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 Qualification. The oil furnished under this specification shall be a product that is authorized by the qualifying activity for listing on the applicable Qualified Products List (QPL) before contract award (see 6.3 and 6.3.1).

3.2 Materials. See 6.3.3 and 6.3.4.

3.2.1 Hazardous materials. The lubricating oil furnished under this specification shall have no adverse effect on the health of personnel when used for its intended purpose, that is, as a weapons lubricant.

3.2.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials shall be used to the maximum extent possible provided that the material meets

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or exceeds the operating and environmental requirements, and promotes economically advantageous life cycle costs.

3.3 Operating requirements. The oil shall provide the operating capabilities as specified in 3.3.1 through 3.3.10.

3.3.1 Hydrolytic stability. The lubricating oil shall demonstrate it is stable when in contact with water.

3.3.2 Swelling of synthetic rubber. The oil shall cause no more than a 25% increase in the volume of NBR-L rubber, per SAE AMS 3217/2, when the rubber is submerged in the oil.

3.3.3 Flash point. The minimum flash point for the oil shall be 305°F (162.7°C).

3.3.4 Pour point. The lowest pour point of the oil shall be no higher than -75°F (-59.4°C).

3.3.5 Neutralization number. The neutralization number of the oil indicating the acidic or basic content shall not exceed 1.

3.3.6 Viscosity. The kinematic viscosity of the oil in centistokes at 100°F (37.8°C), shall be a minimum of 5.8 and at -65°F (-54°C), shall be a maximum of 950.

3.3.7 Precipitation. The maximum precipitation number of the insoluble materials in the oil shall not exceed 0.05 ml.

3.3.8 Evaporation loss. The evaporation loss of the oil at 210°F (98.9°C) shall not exceed 10%.

3.3.9 Lubricating durability. The oil, when applied to a M60 machine gun, shall prevent the gun from seizing and not reduce the cyclic rate of fire by more than 75 rounds per minute.

3.3.10 Physical appearance. The oil shall be clear and uniform in appearance and shall show no evidence of sediment or separated matter.

3.4 Environmental requirements. The oil shall function under the environmental conditions specified in 3.4.1 through 3.4.3.2 without degradation or loss of performance.

3.4.1 Corrosion protection. The oil shall inhibit ferrous metals from rusting after exposure to 400 hours in a high humidity environment.

3.4.2 Oxidation stability. The oil shall provide stability from oxidation when exposed to metals.

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3.4.3 Storage stability.

3.4.3.1 Low temperature. The oil additives shall not precipitate or separate when the oil is stored at -65°F (-54°C) for 168 hours.

3.4.3.2 Ambient temperature. The oil shall not precipitate or separate when stored for six months at 65° to 95°F (18.3° to 35°C). The oil shall meet the hydrolytic stability and evaporation loss requirements after storage.

3.5. Support and ownership requirements.

3.5.1 Identification marking. The oil container shall be marked with the following warning notice:

WARNING !

Do not use this lubricating oil in food-processing or food-handling machinery or on surfaces that may contact food. Do not allow the oil to contaminate foodstuffs.

CAUTION: This lubricant may soften paint, natural rubber, plastics, or neoprene with which it comes in contact.

4. VERIFICATION

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

- a. Qualification inspection (see 4.1.2)
- b. Conformance inspection (see 4.1.3)

4.1.1 Inspection conditions. Unless otherwise specified, all inspection and qualification tests shall be performed in accordance with the test conditions specified herein and Method 9601 of FED-STD-791.

4.1.2 Qualification inspection. Qualification inspection of the oil shall consist of tests for all of the requirements specified in section 3.

4.1.2.1 Qualification samples. The qualification sample shall consist of the finished products and, in addition, if the final formulation of the product contains solid materials, a sample shall be provided identical in nature to the final product but without the addition of any solids. Sample size shall be as specified by the qualifying activity (see 6.2).

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4.1.3 Conformance inspection. Conformance inspection consists of tests for all the requirements specified in Table I, except for lubricating durability (4.3.2.9) and storage stability (4.3.3.3).

4.2 Verification methods. Verification methods shall be as specified in Table I.

4.2.1 Verification alternatives. The contractor or the government may propose alternative test methods, techniques, or equipment, including the application of statistics process control, tool control, or cost-effective sampling procedures in place of verifications in this specification.

4.3 Tests.

4.3.1 Sampling for tests. A representative sample of the oil shall be selected in accordance with ASTM Methods D4057 and D4177.

4.3.1.1 Rejection of lots. If the sample of lubricating oil fails to meet any of the specified test, the lot represented by this sample shall be rejected.

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TABLE I - Requirements and verification methods.

Property	Requirement	Verification	Qualification	Conformance Inspection
Operating Requirements				
Hydrolytic stability	3.3.1	4.3.2.1	X	X
Swelling of synthetic rubber	3.3.2	4.3.2.2	X	X
Flash point	3.3.3	4.3.2.3	X	X
Pour point	3.3.4	4.3.2.4	X	X
Neutralization number	3.3.5	4.3.2.5	X	X
Viscosity	3.3.6	4.3.2.6	X	X
Precipitation	3.3.7	4.3.2.7	X	X
Evaporation loss	3.3.8	4.3.2.8	X	X
Lubricating durability	3.3.9	4.3.2.9	X	
Physical appearances	3.3.10	4.3.2.10	X	X
Environmental Requirements				
Hazardous materials	3.2.1	4.3.5	X	X
Corrosion protection	3.4.1	4.3.3.1	X	X
Oxidation stability	3.4.2	4.3.3.2	X	X
Storage stability				
Low temperature	3.4.3.1	4.3.3.3.1	X	
Ambient temperature	3.4.3.2	4.3.3.3.2	X	
Support and Ownership Requirements				
Identification marking	3.5.1	4.3.4.1	X	X

4.3.2 Operating requirements verification.

4.3.2.1 Hydrolytic stability. Conduct this test for 48 hours at 200°F(93.3°C) in accordance with Method 3457 of FED-STD-791 with the following changes:

- a. Polish the copper strip with silicon carbide or aluminum oxide having cloth or paper backing rather than emery paper.

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- b. The Gooch crucible to be used is described as follows:
Filtering crucible, fritted glass disk, low form Gooch type, Pyrex brand, 30 ml capacity, medium porosity, 14 microns nominal maximum pore size.
- c. Prepare the Gooch crucible as follows: Screen white, sharp silica sand through a No. 40 sieve conforming to ASTM E11 and ASTM E323. Transfer the sand remaining on the sieve to a beaker and wash it with 6 normal hydrochloric acid, 6 normal sodium hydroxide, and hot distilled water or water of equal purity until the rinse water is neutral to litmus. Wash the sand with methyl alcohol. Wash the crucible with hot glass cleaning solution (potassium dichromate and sulfuric acid), distilled water or water of equal purity, and methyl alcohol. Place 25 grams of the cleaned sand in the crucible and wash it several times with distilled water or water of equal purity and methyl alcohol to distribute the sand uniformly. Place the crucible and contents in a gravity convection oven maintained at $250^{\circ} \pm 5^{\circ}\text{F}$ ($121.1^{\circ} \pm 2^{\circ}\text{C}$) for 15 ± 2 minutes. Remove the crucible from the oven, cool it and weigh it to within 0.2 mg. Repeat the heating and cooling until a constant weight is obtained.
- d. After filtering the liquid contents through the tared Gooch crucible, rinse the container with 25 ml of distilled water or water of equal purity, and filter the washings through the Gooch crucible.
- e. After completing the test the following determinations shall be made:
1. The change in the weight of the copper strip shall not exceed 0.5 mg per square centimeter of surface.
 2. The neutralization number of the oil shall not have increased by more than 0.5 mg KOH from the original neutralization number of the oil.
 3. The viscosity of the oil at 100°F (37.8°C) shall not have changed by more than $\pm 20\%$ from the original viscosity of the oil.
 4. The neutralization number of the aqueous portion shall not exceed mg KOH.
 5. The amount of insoluble material produced during the test shall not be greater than 0.5% by weight of the original oil sample.

The amount of insoluble material produced during the test shall not be greater than 0.5% by weight of the original oil sample. Oil containing insoluble material in excess of 0.5%, and/or an increase in neutralization number of the aqueous portion by more than 0.5% mg. KOH, shall be cause for rejection.

4.3.2.2 Swelling of synthetic rubber. The oil shall be tested for 168 hours at $158^{\circ} \pm 5^{\circ}\text{F}$ ($70^{\circ} \pm 2^{\circ}\text{C}$) in accordance with FED-STD-791, Method

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No. 3603 to determine swelling of the specimen, except test each rubber specimen in a separate tube.

4.3.2.3 Flash point. The flash point of the oil shall be determined in accordance with ASTM D92. A flash point at any temperature below 305°F (162.7°C) shall be cause for rejection.

4.3.2.4 Pour point. The pour point of the oil shall be determined in accordance with ASTM D97. Oil that does not pour at -75°F (59.4°C) or lower shall be cause for rejection.

4.3.2.5 Neutralization number. The neutralization number maximum point shall be determined in accordance with ASTM D974. A neutralization number more than 1 shall be cause for rejection.

4.3.2.6 Viscosity. The viscosity of the oil shall be determined in accordance with ASTM D445. Viscosity outside the range specified in 3.3.6 shall be cause for rejection.

4.3.2.7 Precipitation. The precipitation number maximum point shall be determined in accordance with ASTM D91. Precipitation number of the insoluble materials in excess of 0.05 ml shall be cause for rejection.

4.3.2.8 Evaporation loss. The evaporation loss shall be conducted in accordance with ASTM D972. This test shall be conducted at 210°F (99°C). A loss of more than 10 percent of the volume of the test sample shall be cause for rejection.

4.3.2.9 Lubricating durability. The lubricating performance of the oil shall be determined on a 7.62 mm M60 machine gun, air cooled, link belt fed, and gas operated. The gun shall be disassembled and cleaned of all traces of lubricant and dirt by washing with a volatile mineral spirits, such as P-D-680 dry cleaning solvent or TT-N-95 naphtha. After complete removal of the solvent from all surfaces of the gun by use of a water free air hose or by air drying, all components except the barrel shall be coated with the test lubricant by brushing. The barrel, both in the bore and the external surface, shall be coated lightly with the lubricant using a clean, lint free patch. The patch shall be dipped in the oil and then squeezed to remove excess oil. The gun shall then be reassembled and bench tested for operational use. The gun shall be test fired for 20 rounds in an ambient temperature of 50° to 100°F (10° to 37.8°C) and the cyclic rate of fire recorded. Upon satisfactory completion of the ambient temperature test, the gun shall be disassembled, cleaned and re-lubricated for the next phase of the test. With the bolt in the rearward (firing) position and the selector lever set on "safe" the weapon shall be loaded with a 50 round belt of ammunition and conditioned at $-70^{\circ} \pm 5^{\circ}\text{F}$ ($-56.6^{\circ} \pm 2^{\circ}\text{C}$) for 16 ± 1 hours. The weapon shall then be placed in the firing fixture, the selector lever set on

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"fire", and the entire 50 rounds fired with one pull of the trigger, recording the cyclic rate of fire. Reload the weapon as above and condition at $-70^{\circ} \pm 5^{\circ}\text{F}$ ($-56.6^{\circ} \pm 2^{\circ}\text{C}$) for an additional 3 hours. Fire the entire 50 rounds and again record the cyclic rate of fire. Stoppages of the gun attributable to the oil, or a reduction in the rate of fire of more than 75 rounds per minute under the original rate, shall constitute performance failure. The weapon shall not show evidence of abnormal wear.

4.3.2.10 Physical appearance. Pour the oil into a clear glass container and note the appearance. The oil shall show no evidence of sediment or suspended matter when examined visually.

4.3.3 Environmental requirements verification.

4.3.3.1 Corrosion protection. Corrosion protection testing shall be in accordance with FED-STD-791, Method 5329. After testing, a total of no more than three corrosion dots, none of which exceeds one millimeter in length, width, or diameter, shall be evident on the test panels. Corrosion on the outer .25 inch (6 mm) of the panels shall not be cause for rejection.

4.3.3.2 Oxidation stability.

4.3.3.2.1 Preparation of test specimens. Use two metal specimens for this test, each approximately 1.75 in. (4.45 cm) by 0.375 in. (0.95 cm) by 0.025 in. (0.06 cm). Make one specimen from copper conforming to ASTM B152 and one specimen from steel conforming to FS 1009, QQ-S-698. Polish the specimen to remove all pits, burrs and irregularities from the faces and edges. Initial polishing may be done with the aid of a slow-speed horizontal metallurgical polishing wheel. Final polishing may be done with 240 grit silicon carbide or aluminum oxide abrasive having cloth or paper backing. Moisten the cloth or paper bonded abrasive with solvent conforming to P-D-680. After polishing, spray the specimens with naphtha conforming to TT-N-95 followed by a rinse in hot naphtha and hot methanol conforming to O-M-232. Do not touch the specimens with the hands after they have been polished and cleaned.

4.3.3.2.2 Test procedure. Weigh the metal specimens. Weigh 150 ± 5 grams of the lubricating oil into a Pyrex test tube approximately 500 mm long by 50 mm O.D. fitted with an air inlet tube and reflux condenser. Connect the copper and steel specimens with a copper wire and support them with a glass holder equipped with glass hooks. Arrange the specimens so that they will not touch each other during the test. Immerse the specimens in the oil so that they are completely covered. Place the tube and condenser assembly in a bath maintained at $212^{\circ} \pm 1^{\circ}\text{F}$ ($100^{\circ} \pm 0.5^{\circ}\text{C}$). By means of a glass tube, pass air which has previously passed through two towers, one containing soda lime and the second containing glass wool, through the oil at a

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rate of 5 ± 0.2 liters per hour. Pass the gases which escape through the reflux condenser into a trap containing 50 ± 1 ml of 0.1 normal KOH diluted to 150 ml of distilled water or water of equal purity. Conduct the test for a total of 168 ± 1 hours. At the end of the test period, remove the test tube and condenser assembly from the bath, disassemble it and remove the metal specimens. Wash the metal specimens with reagent grade benzene and reagent grade acetone. Weigh the specimens. Examine the oxidized oil visually for insoluble materials and gumming. Determine the viscosity of the oxidized oil at $-65^\circ \pm 0.2^\circ\text{F}$ ($-53.9^\circ \pm 0.1^\circ\text{C}$). Determine the neutralization number of the oil by ASTM Method D974. If this method does not provide a definite end point, the alternate procedure described in 4.3.3.2.3 may be used. Determine the acid number of the volatile components (material collected in the trap) as specified in 4.3.3.2.4.

4.3.3.2.3 Alternate procedure for neutralization number. Weigh 10 ± 0.5 grams of oil to the nearest 0.1 gram into a 300 ml Erlenmeyer flask and add 50 ± 1 ml of neutralized reagent grade ethyl alcohol. Agitate the flask thoroughly, heat it to boiling and cool it to room temperature. Remove the oil layer by decantation. Heat the alcohol phase in the flask to boiling and titrate to the end point using phenolphthalein as the indicator. If the end point is in doubt add 50 ± 2 ml of boiling neutralized distilled water or water of equal purity and observe the solution for the end point color. If necessary, additional titration will produce the desired color which marks the end point.

4.3.3.2.4 Acid number of volatile components. Determine the acid number of the volatile components formed by the oxidation of the oil by back titration of the solution in the potassium hydroxide trap. Add a known amount of 0.1 normal sulfuric acid, approximately 10% in excess of the potassium hydroxide contained in the solution. Boil the mixture for 5 ± 1 minutes under a reflux condenser. Remove the reflux condenser and titrate the hot solution with standard 0.1 normal potassium hydroxide using phenolphthalein indicator.

4.3.3.2.5 Test parameters. After completing the test, the following determinations shall be made:

- a. The change in weight of the copper and steel shall not exceed 0.2 mg per square centimeter of surface.
- b. The viscosity of the oil at $-65^\circ \pm 5^\circ\text{F}$ ($-54^\circ \pm 2^\circ\text{C}$) shall not exceed 1200 centistokes.
- c. The neutralization number of the oil shall not have increased by more than 0.5 mg KOH from the oil's original neutralization number.
- d. The neutralization number of any volatile components formed shall not exceed 0.5 mg KOH.
- e. There shall be no visual evidence of separation of insoluble materials or gumming of the oil.

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4.3.3.3 Storage stability.

4.3.3.3.1 Low temperature. Maintain a sample of the oil, not less than 4 ounces, at a temperature of $-65^{\circ} \pm 5^{\circ}\text{F}$ ($-54^{\circ} \pm 2^{\circ}\text{C}$) for a period of 168 ± 4 hours and examine it for conformance with the requirements in 3.4.3.1. A slight cloudiness shall not be cause for rejection.

4.3.3.3.2 Ambient temperature. Maintain a one-quart sample of the oil, in a glass-stoppered, clear, wide mouth glass container, at a temperature of 65° to 95°F (18.3° to 35.0°C) for a period of six months ($180 \text{ days} \pm 5 \text{ days}$) and examine it for conformance with the requirements of paragraph 3.4.3.2. A slight cloudiness shall not be cause for rejection.

4.3.4 Support and ownership requirements verification.

4.3.4.1 Identification marking. The exterior of the lubricating oil containers shall be visually inspected to ensure that they are properly marked. Failure to have the required warnings on the containers shall be cause for rejection.

4.3.5 Hazardous materials. The supplier shall have available all data necessary for the evaluation of the safety of the product. See 6.3.2 and 6.3.4.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

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6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. The lubricating oil covered by this specification is intended primarily for the lubrication of aircraft and ground weapons to ensure efficient firing at low temperatures. The oil covered by this specification is considered military unique because it must perform at temperatures between 0°F to -70°F (-17.8° to -56.6°C).

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- c. Qualification sample size (see 4.1.2.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time of award or contract, qualified for inclusion in the applicable QPL, whether or not such products have actually been listed by that date. The attention of the contractors is called to these requirements, 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 purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from (U.S. Army TACOM-ARDEC, Attn: AMSTA-AR-QAW-E, Picatinny Arsenal, NJ 07806-5000).

6.3.1 Re-qualification. Any changes in the formulation or processing of a qualified product will necessitate its re-qualification. Oil supplied under contract shall be identical, within manufacturing tolerances, to the approved qualification sample. The qualifying activity may, at its discretion, request complete re-qualification testing or require only partial re-qualification in order to determine the significance, impact and acceptability of any proposed formulation change, manufacturing process or change in manufacturing location.

6.3.2 Product formulation. At the time of "application for qualification testing" but no later than the date of initiation of such testing, the lubricant manufacturing or distributing source of supply shall identify the product formulation, including constituent material, percentage used in finished product and the manufacturing source of supply of each component (solvent, base oil, additive

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etc.). Any change to the product formulation so identified without first alerting the qualifying activity identified in 6.3 accordingly, shall be immediately removed from the QPL. The qualifying activity may perform an infrared spectrophotometric scan of sample submission and file same with formulation. The qualifying activity, at its discretion, will employ the filed scan to examine product samples taken from lot submissions for the periodic re-evaluation tests.

6.3.3 Materials. Unless otherwise specified, the materials and manufacturing process selection are the prerogative of the contractor as long as all articles submitted to the government fully meet the operating and environmental requirements specified herein.

6.3.4 Material safety data sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government addresses for submission of data are listed in FED-STD-313; and 29 CFR 1910.1200 requires that the Material Safety Data Sheet for each hazardous chemical used in an operation must be readily available to personnel using the material. Contracting officers will identify the activities requiring copies of the Material Safety Data Sheets.

6.4 Definitions.

6.4.1 Bulk lot. An indefinite quantity of a homogeneous mixture of oil offered for acceptance in a single, isolated container, or manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment and with no change in the ingredient materials.

6.4.2 Packaged lot. An indefinite number of 55 gallon drums or smaller unit containers of identical size and type, offered for acceptance, and filled with a homogenous mixture of oil manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment and with no change in the ingredient materials.

6.5 Subject term (key word) listing.

Coating
LAW
NATO Code Number O-157
Preservative

6.6 International standardization agreement. Certain provisions of this specification are the subject of international standardization agreement (NATO STANAG 1135). When amendment, revision or cancellation of this specification is proposed which will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels,

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including departmental standardization offices, to change the agreement or make other appropriate accommodations.

6.7 National stock numbers. The following National stock numbers have been assigned to the lubricating oil covered by this specification:

1 - qt. can	9150-00-292-9689
5 - gal. can	9150-00-292-9687

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue to the extent of the change.

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CONCLUDING MATERIAL

Custodians:

Army-AR
Air Force-11
Navy-OS

Preparing activity:

Army-AR

(Project 9150-1236)

Review activities:

Army-AT, AV

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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 documents(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-14107D	2. DOCUMENT DATE (YYMMDD) 001020
3. DOCUMENT TITLE Lubricating Oil, Weapons, Low Temperature		
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION	
c. ADDRESS (<i>Include Zip Code</i>)	d. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (<i>if applicable</i>)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME U. S. Army TACOM-ARDEC	b. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (973) 724-6671	(2) AUTOVON 880-6671
c. ADDRESS (<i>Include Zip Code</i>) ATTN: AMSTA-AR-QAW-E, B-12 Picatinny Arsenal, NJ 07806-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403 Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	