

MIL-L-6081C(ASG)

15 APRIL 1964

Superseding  
 MIL-O-6081B(ASG)  
 23 October 1953

## MILITARY SPECIFICATION

## LUBRICATING OIL, JET ENGINE

This specification has been approved by the Department of the Air Force and by the Bureau of Naval Weapons.

## 1. SCOPE

1.1 Scope.— This specification presents requirements for two grades of jet engine lubricating oil.

1.2 Classification.— The lubricating oil shall be furnished in the following grades, as specified (see 6.2):

<u>Grade</u>	<u>NATO Symbol</u>
1010	<u>0-132</u>
1005	<u>0-133</u>

## 2. APPLICABLE DOCUMENTS

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

STANDARDSFederal

FED. TEST METHOD STD. NO. 791	Lubricants, Liquid Fuels, and Related Products; Methods of Testing
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Military

MIL-STD-290	Packaging, Packing and Marking of Petroleum and Related Products
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FSC 9150

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

2.2 Other publications.— The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply:

American Society for Testing and Materials

Standards on Petroleum Products and Lubricants

Manual on Measurement and Sampling of Petroleum and Petroleum Products

(Copies of ASTM publications may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.)

### 3. REQUIREMENTS

3.1 Qualification.— The jet engine lubricating oil furnished under this specification shall be a product which has been tested, and has passed the qualification tests specified herein, and has been listed on or approved for listing on the applicable Qualified Products List (QPL).

3.1.1 Requalification.— Requalification may be required in the event any change is made in the quality, composition, source of ingredient or source of supply of the finished lubricant. Requalification is mandatory if any changes are made in the lubricant base stocks.

3.2 Data.— Unless otherwise specified in the contract or order, no data (other than reports and drawings accompanying qualification samples) are required by this specification or any of the documents referenced in section 2 herein (see 6.2).

3.3 Materials.— The lubricating oil shall be a refined petroleum product and may contain oxidation inhibitors and pour-point depressants. The use of viscosity index improvers is prohibited.

3.4 Properties.— The properties of the lubricating oil shall conform to table I.

3.4.1 Viscosity stability.— Viscosity determinations, when conducted at the specified temperatures shall be within specification limits and after 3 hours at the test temperatures shall not have changed by more than the following limits:

<u>Oil</u>	<u>Temperature</u>	<u>Maximum viscosity change in centistokes after 3 hours (percent)</u>
Grade 1005	-65° F	3
Grade 1010	-40° F	2

TABLE I. Properties

	Grade 1010	Grade 1005
Viscosity, centistokes at 100° F (37.8° C), min.	10.0	5.0
Viscosity, centistokes at -40° F (-40° C), max.	3,000	—
Viscosity, centistokes at -65° F (-54° C), max.	—	2,600
Flash point, min.	270° F (132° C)	225° F (107° C)
Pour point, max.	-70° F (-57° C)	—
Color, ASTM, max.	No. 5.5	No. 5.5
Copper strip corrosion, ASTM classification, max.	1	1
Total acid number, max.	0.10	0.10

### 3.5 Corrosion and oxidation stability.

3.5.1 Corrosion.— The change in weight of copper, steel, aluminum alloy, magnesium alloy, and cadmium-plated steel, when subjected to the lubricating oil for 168 hours at 250° F, shall be not greater than  $\pm 0.2$  milligram per square centimeter of surface. There shall be no pitting, etching, or visible corrosion on the surface of any of the metals when viewed under a magnification of 20 diameters. A slight brown stain on the surface of the copper shall be permitted, but dark brown, gray, or black stain shall be cause for rejection. A slight discoloration of the cadmium will be permitted.

3.5.2 Oxidation.— The lubricating oil shall have changed by not more than -5 to +20 percent from the original viscosity at 100.0° F (37.8° C) after the corrosion test. The total acid number shall not have increased by more than 0.20. There shall be no evidence of separation of insoluble materials or gumming of the oil.

3.6 Trace sediment.— After centrifuging, the trace sediment shall be not more than 0.005 ml./200 ml. of oil.

3.7 Workmanship.— The finished lubricating oil shall be transparent, uniform in appearance, and shall be free of cloudiness, suspended matter, or other adulterations, when examined visually by transmitted light.

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#### 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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

4.2 Classification of tests.— The inspection and testing of lubricating oil shall be classified as:

- (a) Qualification tests (4.6)
- (b) Quality conformance tests (4.7)

#### 4.3 Inspection lot.—

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

4.3.2 Packaged lot.— An indefinite number of 55-gallon drums, or smaller unit package, of identical size and type offered for acceptance and filled with a homogeneous mixture of material from one isolated container, or 2,000 lbs. of homogeneous mixture of material manufactured by a single plant run (not exceeding 24 hours) through the same processing equipment with no change in ingredient material.

4.4 Sampling.— Each bulk lot of material shall be sampled for verification of product quality in accordance with Method 8001 of Fed. Test Method Std. No. 791 (ASTM D-270). Each packaged lot of material shall be sampled for verification of product quality and compliance with MIL-STD-290 in accordance with the applicable provisions of 4.7 and 5.1.

4.5 Inspection of material.— Inspection shall be in accordance with Method 9601 of Fed. Test Method Std. No. 791.

#### 4.6 Qualification tests.—

4.6.1 Sampling instructions.— The qualification test samples shall consist of 2 gallons of finished lubricating oil, 1 gallon of the petroleum oil-base stock before the addition of additive agents, and 1 ounce of each of the additive agents used in the finished oil. In the event that additives are supplied as concentrated solutions, an equivalent quantity of the solution shall be furnished. Samples shall be identified as required and forwarded to the activity responsible for testing as designated in the letter of authorization from that activity (see 6.3).

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4.6.1.1 Qualification test samples shall be accompanied by a certified test report containing laboratory test data from a commercial testing laboratory, certified by the activity responsible for qualification, showing the results of all tests specified herein. The test report shall include information as to the source and type of base stock and additive materials used, together with the formulation and composition of the finished oil, indicating the percentage and nature of each ingredient.

4.6.2 Tests.- Qualification tests shall consist of all the tests specified under 4.8.

4.7 Quality conformance tests.- Tests of individual lots which will serve as a basis for Government acceptance shall consist of all requirements specified in section 3. In addition, representative samples of oil obtained from thoroughly shaken, filled and sealed containers, taken at the end of each 2-hour run, shall conform to the workmanship and trace sediment requirements. Also, representative samples of oil obtained from thoroughly shaken, filled and sealed containers (1 quart and 1 gallon only) taken from the packaging line every half hour shall be visually examined by transmitted light for particle contamination. If this examination indicates possible excessive particle contamination, the trace sediment shall be determined.

4.7.1 Rejection and retest.- Lubricating oils which have been rejected may be reworked and replaced to correct the defects, and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the original sample shall be furnished the inspector. Lubricating oil rejected after retest shall not be resubmitted without the specific approval of the procuring activity. Consistent failure of material to pass the aforementioned quality conformance tests shall be cause for removal from the QPL.

4.8 Test methods.-

4.8.1 Chemical and physical tests.- Unless otherwise specified, the following tests shall be made in accordance with the test methods specified in Fed. Test Method Std. No. 791 and table II.

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TABLE II. Test methods 1/

Requirements	Fed. Test Method Std. No. 791	ASTM Standards
Kinematic viscosity at 100° F (37.8° C)	305	D445
Viscosity and viscosity stability at -65° F and -40° F	305	D445
Flash point	1103	D92
Pour point	201	D97
ASTM color	102	D1500
Copper strip corrosion	5325	D130
Acid and base number (color indicator titration)	5105	—
Corrosion and oxidation stability test at 250° F (121° C)	5308	—
Trace sediment in lubricating oils 2/	3004	—

1/ At the time of qualification the right is reserved to subject the lubricating oil to such additional tests as are considered necessary to assure the serviceability of the material.

2/ When using Method 3004 to determine presence of trace sediment in the lubricating oil, no diluents shall be used.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging, packing, and marking.— Packaging, packing, and marking shall be in accordance with MIL-STD-290.

5.2 Filling of containers.— The oil shall be filtered through a suitable filter assembly, rated at 10 microns or finer, situated as close to the container filling equipment as may be feasible.

5.2.1 Specifically, 1-quart and 1-gallon metal containers, as provided by MIL-STD-290, shall be inspected visually just prior to filling for loose solder, dirt, fibers, lint, metal particles, seaming compound, or other foreign contaminants. The bottom seam shall show no extruded seaming compound and there shall be no seaming compound on the body immediately adjacent to the side seam. Visible seaming compound, evenly distributed and forming a very fine edge at the point of contact of the seam with the body, shall not be cause for rejection. If a soldered side seam is used in the fabrication of the can, residual soldering flux shall not be present on the inside seam of the containers. After filling, containers shall be inspected for marking, fill, closure, and leakage.

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## 6. NOTES

6.1 Intended use.- The lubricating oil procurable to this specification is intended for use in specific models of aircraft jet engines.

6.2 Ordering data.- Procurement documents should specify:

- (a) Title, number, and date of this specification.
- (b) Applicable grade (see 1.2).
- (c) Type and size of containers required (see 5.1).
- (d) Level of packaging and packing required (see 5.1).
- (e) Data requirements (see 3.2).

6.3 Qualification.- With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Research and Technology Division, (ATTN: APFL), Wright-Patterson Air Force Base, Ohio 45433, and information pertaining to qualification of products may be obtained from that activity.

6.4. The procedures for securing qualification tests and other details concerning qualification and procurement of this material are contained in the QPL Summary and the Provisions Governing Qualification-Qualified Products List, dated March 31, 1961.

6.5 International standardization.- Certain provisions (see 1.2) of this specification are the subject of international standardization agreement (ABC AIR STD NO. 15/LD, STANAG 3437). When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken respecting the international agreement concerned.

## Custodians:

Navy - Weps  
Air Force - (11)

## Preparing activity:

Air Force - (11)

International interest (see 6.5)

## Reviewer activity:

Navy - Weps  
Air Force - (11), (67)

## User activity:

Navy -  
Air Force -

Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DoD Index of Specifications and Standards.

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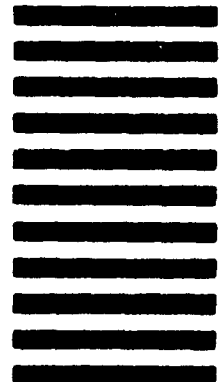
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## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1 DOCUMENT NUMBER

2 DOCUMENT TITLE

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)

(TO DETACH THIS FOR CUT ALONG THIS LINE)