

MIL-L-6082D
 21 October 1969
 Superseding
 MIL-L-6082C
 18 May 1961

MILITARY SPECIFICATION

LUBRICATING OIL: AIRCRAFT RECIPROCATING
 ENGINE (PISTON)

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

1. SCOPE

1.1. Scope - This specification covers lubricating oils to be used in aircraft reciprocating engines.

1.2. Classification - The lubricating oils shall be furnished in the following grades:

<u>Grade</u>	<u>NATO Code No.</u>
Grade 1065	0-113
Grade 1100	0-117

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:

* SPECIFICATIONS

Military

MIL-L-22851 Lubricating Oil, Aircraft Piston Engine
 (Ashless Dispersant)

* STANDARDS

Federal

Fed. Test Method Std. No. 791 Lubricants, Liquid Fuels and Related Products;
 Methods of Testing

FSC 9150

MIL-L-6082D

STANDARDS (Cont'd)

Military

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

(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 document forms a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

American Society for Testing and Materials

ASTM Standards Parts 17 and 18

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

3. REQUIREMENTS

* 3.1 Qualification - The lubricating oil furnished under this specification shall be products which are qualified for listing on the applicable Qualified Products List at the time set for opening of bids (see 6.3).

* 3.1.1 Requalification - Requalification will be required in the event any change in source or composition of the lubricant or ingredients is made. A change from one approved pour point depressant to another (listed on QPL-6082) may be made without requalification, but only after notification to and approval by the activity responsible for qualification.

3.2 Materials - The lubricating oil shall be a refined petroleum product and may contain approved pour point depressants in the maximum amount of 1 percent by weight. Additives, other than pour point depressants, shall not be used.

3.3 Work factor - The work factor shall be not less than 0.85.

3.4 Ash - The ash content of the oil shall not exceed 0.0025 percent by weight.

MIL-L-6082D

3.5 Neutralization number - The neutralization number shall not exceed 0.10.

* 3.6 Trace sediment - The sediment shall not exceed 0.005 milliliter per 100 milliliters of oil.

3.7 Corrosion (copper strip) - The corrosion shall not exceed ASTM Copper Strip Classification 1.

* 3.8 Sulfur - The sulfur content of the oil shall not exceed 0.5 percent by weight on qualification inspection. For quality conformance inspection the sulfur content shall be within ± 0.1 percent of the qualification value or within a 0.2 percent range selected by the manufacturer to bracket the qualification value. The range to be used will be specified on the Qualified Products List.

3.9 Saponification number - The saponification number shall not exceed 0.5.

* 3.10 API gravity - The American Petroleum Institute (API) gravity of the oil shall be determined but not limited on qualification inspection. For quality conformance inspection the gravity shall be within $\pm 0.7^\circ$ API (± 0.004 sp. gr.) of the qualification value, or within a 1.4° API (0.008 sp. gr.) range selected by the manufacturer to bracket the qualification value. The range to be used will be specified on the Qualified Products List.

3.11 Properties - The properties of the individual grades shall also conform to Table I.

3.12 Contamination - The oil shall not contain foreign solid particles in excess of 15 milligrams (mg.) per gallon when filtered through a 200-mesh sieve. Fibrous material, if present, shall not exceed 5 mg. per gallon.

4. QUALITY ASSURANCE PROVISIONS

* 4.1 Responsibility for inspection - Unless otherwise specified in the contract or 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.

* 4.2 Classification of inspection - The inspection and testing of lubricating oil shall be classified as follows:

MIL-L-6082D

- (a) Qualification inspection (4.3)
- (b) Quality conformance inspection (4.4)

* 4.3 Qualification inspection - The qualification inspection shall consist of all the tests of this specification, as specified under 4.5.

4.3.1 Sampling instructions - The qualification samples shall consist of the following quantities:

- (a) A 1-gallon sample of each grade of oil without the pour point depressant. This sample shall be used to determine conformance with the viscosity index requirement.
- (b) A 10-gallon sample of each grade of the finished oil containing a maximum of 1 percent by weight of an approved pour point depressant. This sample shall be used for all other qualification tests. Samples shall be identified as required and forwarded to the activity responsible for qualification, designated in the letter of authorization from that activity (see 6.3).

* 4.3.2 Test report - The manufacturer shall forward a certified test report to the activity responsible for qualification before the qualification test sample is supplied (see 6.3). The test report shall contain laboratory data showing the results of all tests required by this specification, with the exception of the contamination test and the work factor test. In addition, the manufacturer shall furnish the formulation of the lubricant in terms of percentages of neutral and bright stock, the crude oil sources and type of processing of the components, and the brand name, and manufacturer of the pour point depressant.

* 4.4 Quality conformance inspection - Quality conformance inspection shall consist of all the tests of this specification, as specified under 4.5, with exception of the work factor test.

* 4.4.1 Inspection lot -

* 4.4.1.1 Bulk lot - An indefinite quantity of a homogeneous mixture of one grade of oil offered for acceptance in a single container; or manufactured in a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material.

* 4.4.1.2 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 homogeneous mixture of one grade of oil from one isolated container; or filled with a homogeneous mixture of one grade of oil

TABLE I. Properties of grades

Grade	Saybolt universal viscosity at 210°F (99°C)	Viscosity index (minimum) <u>1/</u>	Flash point (minimum)	Pour point degrees (maximum)		Conradson carbon residue (maximum) <u>2/</u>
				Undiluted	Diluted	
1065	62-68	100	420°F (216°C)	0°F (-18°C)	-65°F (-54°C)	0.6
1100	93-103	95	470°F (243°C)	+10°F (-12°C)	-65°F (-54°C)	1.2

1/ Viscosity index requirement shall be determined on the oil without the pour point depressant.

2/ The value of the carbon residue for quality conformance tests shall not vary more than +0.2 from the value determined for qualification, and shall not exceed the limits listed above. This range will be specified on the QPL.

MIL-L-6082D

manufactured in a single plant run (not exceeding 24 hours) through the same processing equipment, with no changes in ingredient materials.

* 4.4.2 Sampling -

* 4.4.2.1 Sampling for product testing - Sample the product for tests in accordance with ASTM Method D270.

* 4.4.2.2 Sampling for examination of filled containers - Each packaged lot of filled containers shall be sampled in accordance with MIL-STD-105, inspection level II, acceptable quality level (AQL) 2.5 percent defective and examined in accordance with 4.4.3.2.

* 4.4.3 Inspection -

* 4.4.3.1 Inspection of material - Inspection shall be performed in accordance with Method 9601 of Federal Test Method Standard 791.

* 4.4.3.2 Examination of filled containers - Examine samples taken in accordance with 4.4.2.2 for compliance with MIL-STD-290 with regard to fill, closure, sealing, leakage, packaging, packing, and marking requirements. Reject any container having one or more defects or under the required fill. If the number of defective or unfilled containers exceeds the acceptance number for the appropriate plan of MIL-STD-105, reject the lot represented by the sample.

4.5 Test methods -

* 4.5.1 Chemical and physical tests - Tests shall be performed in accordance with the methods specified in Table II.

* TABLE II. Test methods

Requirements	Fed. Test Method Std. No. 791	ASTM standards
Stability of lubricating oils (work factor)	3451	----
Ash content	----	D482
Neutralization number	----	D664
Corrosion (copper strip) <u>1/</u>	----	D130
Sulfur (bomb)	----	D129
Saponification number	----	D94
API gravity	----	D287
Viscosity (kinematic) <u>2/</u>	----	D445
Viscosity index (calculation)	----	D2270
Flash point (Cleveland open cup)	----	D92
Pour point	----	D97

MIL-L-6082D

TABLE II. (Cont'd)

Requirements	Fed. Test Method Std. No. 791	ASTM standards
Diluted pour point	204	----
Carbon residue (Conradson)	----	D189
Contamination	3006	----
Trace sediment	----	D2273

1/ Test conditions: Three hours at 212°F (100°C).

2/ Convert to Saybolt universal viscosity, using ASTM Method D2161

5. PREPARATION FOR DELIVERY

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

6. NOTES

* 6.1 Intended use - The lubricating oil covered by this specification is intended for use in aircraft reciprocating engines and for blending type IIa and type IIIa oils under MIL-L-22851.

6.2 Ordering data - Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Grade of lubricating oil required (see 1.2).
- (c) Type and size of containers required (see 5.1).
- (d) Applicable levels of packaging and packing (see 5.1).

* 6.3 Qualification - With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have 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 order for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Air Systems Command, Attn: AIR-5365, Department of the Navy, Washington, D.C. 20360, and information pertaining to qualification of products may be obtained from that activity.

MIL-L-6082D

* 6.4 International standardization agreement - Certain provisions of this specification are the subject of international standardization agreement with NATO (STANAG 1135). When amendment, revision, or cancellation of this specification is proposed which will affect or violate the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels, including departmental standardization offices, if required.

* 6.5 Marginal indicia - The margins of this specification are marked to indicate where changes, deletions, or additions to the previous issue have been made. This is done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Figures are not so marked. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content as written, irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - MR
Navy - AS
Air Force - 11

Preparing activity:

Navy - AS

Project No. 9150-0282

Reviewer activities:

Army - AV, MR

International interest (see 6.4)

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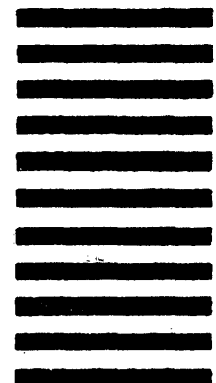
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