

METRIC

MIL-DTL-25681E
8 September 2011

SUPERSEDING
DOD-L-25681D
5 September 1979

DETAIL SPECIFICATION
LUBRICANT, MOLYBDENUM DISULFIDE, SILICONE
(NATO S-1735)



Comments, suggestions, or questions on this document should be addressed to AFPA/PTPT, 2430 C Street, Bldg 70, Area B, Wright-Patterson AFB OH 45433-7632 or e-mailed to AFPET.AFTT@wpafb.af.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.daps.dla.mil>.

AMSC N/A

FSC 9150

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

1. SCOPE

1.1 Scope. This specification covers one grade of lubricant for use on sliding surfaces subject to high temperatures in aircraft gas turbine engines. This lubricant is identified by NATO Code Number S-1735 (see 6.3).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Non-government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM International

ASTM D92	Flash and Fire Points by Cleveland Open Cup Tester (DoD Adopted)
ASTM D445	Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity) (DoD Adopted)
ASTM D1500	ASTM Color of Petroleum Products (ASTM Color Scale) (DoD Adopted)
ASTM D4057	Manual Sampling of Petroleum and Petroleum Products (DoD Adopted)

(Copies of these documents are available online at <http://www.astm.org> or the ASTM International, 100 Barr Harbor Drive, West Conshohocken PA 19428-2959)

Society of Automotive Engineers

AMS-M-7866	Molybdenum Disulfide, Technical – Lubrication Grade (DoD Adopted)
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(Copies of these documents are available online at <http://www.sae.org> or SAE International, 400 Commonwealth Drive, Warrendale PA 15096-0001 USA)

2.3. Order of precedence. Unless otherwise noted herein or in the contract, 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 Toxicity. The materials shall have no adverse effect on the health of personnel when used for their intended purpose.

3.2 Materials. The lubricant shall be of the composition listed in Table I.

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Table I. Composition of MIL-DTL-25681

Material	Percent by weight
Molybdenum disulfide	50 ± 1%
Silicone oil	50 ± 1%

3.3 Chemical characteristics. The chemical characteristics of each component shall be as follows:

3.3.1 Molybdenum disulfide. The molybdenum disulfide shall conform to AMS-M-7866.

3.3.2 Silicone oil. The silicone oil shall be methyl phenyl polysiloxane. A corrosion inhibitor shall be permitted.

3.4 Physical characteristics. The physical characteristics of each component shall be as follows:

3.4.1 Molybdenum disulfide. The molybdenum disulfide shall conform to AMS-M-7866.

3.4.2 Silicone oil. The silicone oil shall conform to the characteristics listed in Table II.

Table II. Physical characteristics of silicone oil component

Characteristics	Limits	Test Method
Color (ASTM Color)	2.0 (maximum)	ASTM D1500
Flash point	274°C (minimum)	ASTM D 92
Viscosity at 100°C	16 – 22 mm ² /s	ASTM D445
Viscosity at 40°	65 to 85 mm ² /s	ASTM D445

3.5 Homogeneity. The two components shall be thoroughly and uniformly blended together to form a homogeneous mixture at the time of packaging. (The molybdenum disulfide tends to settle to the bottom of the container.)

3.6 Workmanship. When examined visually, the finished lubricant shall contain no adulterations and, after blending, shall be uniform in appearance.

4. VERIFICATION

4.1 Classification of inspection. The inspection requirement specified herein is classified as conformance inspection (see 4.2).

4.2 Conformance inspection. Conformance inspection shall include the lotting of 4.3 and sampling of 4.4.

4.3 Lot.

4.3.1 Bulk lot. A bulk lot is an indefinite quantity of homogeneous mixture of lubricant offered for acceptance in a single isolated container or manufactured in a single plan run (not exceeding 24 hours) through the same processing equipment with no change in the ingredient materials.

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4.3.2 Packaged lot. A packaged lot is an indefinite number of 209 liter (55 gallon) drums smaller unit containers of identical size and type filled with a homogeneous mixture of material manufactured in a single plant run (not exceeding 24 hours) through the same processing equipment with no change in ingredient materials.

4.4 Sampling.

4.4.1 Sampling for tests. Sampling of a lot for test purposes shall be done in accordance with ASTM D 4057.

4.5 Classification of tests. All tests are classified as conformance tests.

4.6 Test methods. The color, flash point, and kinematic viscosities at 40°C and 100°C will be determined on the silicone oil component of the lubricant in accordance with the applicable test method as listed in table II. Values obtained falling outside the limits stated in table II shall be cause for rejection of the lot.

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 materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. 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.

6. NOTES

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

6.1 Intended use. The lubricant is intended for use on slow-speed sliding surfaces operating at temperatures up to 400°C and for use as an antiseize compound on threaded parts which operate at temperatures up to 760°C. This material has not been investigated for use in antifriction bearings.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Quantity required.
- c. Packaging requirements (see 5.1).
- c. Additional marking requirements – mark individual containers as follows: “STIR WELL IMMEDIATELY BEFORE USING” due to the tendency of this lubricant to settle into two layers.

6.3 International standardization agreements. Certain provisions of this specification are the subject of international standardization agreements STANAG 1135 and AIR STD 15/9. When amendment, revision, or cancellation of this specification is proposed, the preparing activity must coordinate the action with the U.S. National Point of Contact for the international standardization agreement, as identified in the ASSIST database at <https://assist.daps.dla.mil>.

6.4 Material Safety Data Sheets. Contracting officers will identify those activities that require copies of completed Material Safety Data Sheets (MSDS) prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313.

6.5 Shelf-life. This specification covers items where the assignment of a Federal shelf-life code is a consideration. Specific shelf-life requirements should be specified in the contract or purchase order, and should include, as a minimum, shelf-life code, shelf-life package markings in accordance with MIL-STD-129 or FED-STD-123, preparation of a material quality storage standard for type II (extendible) shelf-life items, and a minimum of 85 percent shelf-life remaining at the time of receipt by the Government. These and other requirements, if necessary, are in DoD 4140.27-M, Shelf-Life Management Manual. The shelf-life codes are the in Federal Logistics Information System Total Item Record. Additive information

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for shelf-life management may be obtained from DoD 4140.27-M, or the designated shelf-life Points of Contact (POC). The POC should be contacted in the following order: (1) the Inventory Control Points that manage the item and (2) the DoD Service and Agency administrators for the DoD Shelf-Life Program. Appropriate POCs for the DoD Shelf-Life Program can be contacted through the DoD Shelf-Life Management website: <https://www.shelflife.hq.dla.mil/>.

6.6 Subject term (keyword) listing.

Antiseize compound
Gas turbine engine
Oil

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

Custodians:

Army – CR4
Navy – AS
Air Force – 68
DLA – GS

Preparing activity:

Air Force – 68
(Project 9150-2011-007)

Review activities:

Army - MI
Army -AR
DLA – PS
Other - DS

Note: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information using the ASSIST Online database at <https://assist.daps.dla.mil/>.