MIL-G-83363B
24 November 83
SUPERSEDING
MIL-G-83363A
23 July 1982

MILITARY SPECIFICATION

GREASE, TRANSMISSION, HELICOPTER

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 type of extreme pressure, antiwear helicopter transmission grease. This grease is identified by NATO Code Number G-396 (see 6.4).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Standards. Unless otherwise specified, the following standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

STANDARDS

FEDERAL

FED-STD-313	-	Material Safety Data Sheets, Preparation and Submission of.
FED-STD-791	-	Lubricants, Liquid Fuels and Related Products; Methods of Testing.

MILITARY

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

(Copies of standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: AFWAL/MLSE, Wright-Patterson AFB, OH 45433 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 9150

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

* AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 217 - Grease Lubricating, Cone Penetration of.
ASTM D 972 - Greases and Oils, Lubricating, Evaporation Loss of (R 1981).
ASTM D 1478 - Greases, Ball Bearing, Low Temperature Torque.
ASTM D 2266 - Grease, Lubricating, Wear Preventive Characteristics of (Four-ball method).
ASTM D 2596 - Lubricating Grease, Measurement of Extreme Pressure Properties of (Four-ball method) (R 1980).
• ASTM D 4057 - Manual Sampling of Petroleum and Petroleum Products, Practice for.

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

* (Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Materials. The grease shall be a homogeneous mixture of a * polyol aliphatic ester, a fluorinated polysiloxane, a sodium montmorillonite clay, fluorinated ethylene propylene copolymer, antimony dialkyldithiocarbamate, and other additives as necessary.

3.2 Grease properties.

3.2.1 Penetration, unworked. The unworked penetration of the * grease shall not be less than 260 nor more than 320 when tested as specified in 4.6.1.

3.2.2 Penetration, worked. The worked penetration of the grease shall not be more than 340 when tested as specified in 4.6.1.

3.2.3 Worked stability. The penetration of the grease after working 100,000 double strokes shall not be more than 375 when tested as specified in 4.6.1.

3.2.4 Evaporation. The grease shall not lose more than 5 percent of its weight after 22 hours at 300°F (148.9°C) when tested as specified in 4.6.1.

3.2.5 Oil separation. The grease shall not lose more than 10 percent of its weight in 30 hours at 300°F (148.9°C) when tested as specified in 4.6.1.

3.2.6 Load wear index. The load wear index value of the grease shall be not less than 90 when tested for load carrying capacity as specified in 4.6.1.

* 3.2.7 Steel on steel wear. When tested as specified in 4.6.1 the wear scar diameters shall not be greater than that listed in table I. The temperature shall be monitored and recorded for the ambient temperature, test, and the temperature shall not be greater than 167°F (75°C).

TABLE I. Steel on steel wear test.

Specimen Material	Test Duration	Temperature, °F	Scar Diameter
AISI-C-52100 Steel	2 hours	167 (75°C)	1.30 max.
AISI-C-52100 Steel	4 hours	Ambient	1.30 max.

3.2.8 Low temperature torque. A No. 204 open ball bearing lubricated with the grease shall give a starting torque of not more than 3,000 g-cm and a running torque of not more than 1,000 g-cm when tested as specified in 4.6.1.

3.2.9 Storage stability. After storing for six months as specified in 4.6.3 the worked penetration of the grease shall not have changed from the original worked penetration by more than 30 points. The unworked penetration shall not be less than 250.

3.2.10 Workmanship. The grease shall be a high quality, smooth, homogeneous product, free from abrasives and impurities when examined as specified in 4.6.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 Inspection lot.

4.2.1 Bulk lot. An infinite 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.

4.2.2 Packaged lot. An indefinite number of 55 gallon (208.175 L) drums or smaller unit packages of identical size and type, offered for acceptance, and filled with a 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.

4.3 Sampling. Sampling shall be in accordance with ASTM D 4057.

4.4 Inspection. Inspection shall be in accordance with method 9601 of FED-STD-791.

4.5 Classification of tests. The inspection and testing of the grease shall be classified as acceptance tests.

4.5.1 Acceptance tests. Tests for acceptance of individual bulk or packaged lots shall consist of tests for worked penetration, evaporation, and steel on steel wear at 167°F (75°C) for two hours. Material safety sheets shall be submitted to AFWAL/MLSE, Wright-Patterson AFB, OH 45433 in accordance with FED-STD-313.

* 4.6 Test procedures.

* 4.6.1 List of test methods. The tests of this specification shall be conducted in accordance with the applicable test method of FED-STD-791 as listed in table II, and other methods as described in 4.6.2 and 4.6.3.

* TABLE II. Test methods.

Test	FED-STD-791 Method No. 1/	ASTM
Penetration	311.7	D 217
Worked stability	313.2	D 217
Evaporation	2/ 351.2	D 972
Oil separation	2/ 321.2	
Load wear index		D 2596
Steel on steel wear	3/	D 2266
Low temperature torque	4/ 334	D 1478

1/ Where a corresponding ASTM number is listed, the ASTM method is to be used in conducting the test.
2/ The test temperature shall be 300°F (149°C).
3/ The test specimen materials, test temperature, and length of tests shall be as specified in table I.
4/ The test temperature shall be -65°F ±5°F (-54°C ±3°C).

4.6.2 Examination of the product. The sample grease shall be inspected visually and a suitable portion shall be worked with a spatula on a glass surface. After working, the grease shall be spread with a straight edge and observed for uniformity as indicated by a smooth surface.

4.6.3 Storage stability. The penetration after storage shall be determined on a sample of grease which has been stored at a temperature of 100° ±5°F (38° ±3°C) in a 1-pound (.454 kg) oiltight container for six months subsequent to the original determination of the penetration. The worked and unworked penetrations after storage shall be determined in accordance with method 311 of FED-STD-791.

5. PACKAGING

5.1 Packaging and packing. The grease shall be packaged and packed for the level specified (see 6.2) in accordance with MIL-STD-290. The type and size of containers shall be as specified by the procuring activity (see 6.2).

5.2 Markings. In addition to any special markings required by the contract or order, all containers shall be marked in accordance with MIL-STD-290. The marking nomenclature shall be as follows:

GREASE, TRANSMISSION, HELICOPTER.

6. NOTES

6.1 Intended use. The grease covered by this specification is intended for use in helicopter tail rotors, intermediate transmissions and gear boxes. Other applications include screw jack actuators, fine pitch gear trains, servomechanisms, journal bearings and helicopter rotor hubs.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Quantity desired.

c. Levels of packaging and packing (see 5.1).

d. Type and capacity of containers (see 5.1).

6.3 Source of apparatus.

6.3.1 Shell four-ball wear testers. Shell four-ball testers may be obtained from the Precision Scientific Company, Chicago, IL 60600, Catalog No. 73603.

6.4 International standardization agreement. Certain provisions of this specification (see 1.1) are the subject of international standardization agreement, NATO Code Number G-396. 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

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

6.5 Change from previous issue. The margins of this specification are marked with asterisks 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 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.

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* Navy - AS

Review activities:
Air Force - 68
* Army - AV

Preparing Activity:
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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
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