

**NOT MEASUREMENT
SENSITIVE**

**MIL-PRF-83363C
20 February 1998
SUPERSEDING
MIL-G-83363B
24 November 1983**

**PERFORMANCE 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 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 lists, 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.

2.2 Government documents

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: ASC/ENSI, 2530 Loop Road West, Wright-Patterson AFB OH 45433-7101, by using the Standardization Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A

FSC 9150

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STANDARDS

FEDERAL

FED-STD-791 Lubricants, Liquid Fuels and Related Products; methods of Testing

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, phone (215) 697-2667.)

2.3 Non-Government Publications. The following documents 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 D217	Grease Lubricating, Cone Penetration of
ASTM D972	Greases and Oils, Lubricating, Evaporation Loss of
ASTM D1478	Greases, Ball Bearing, Low Temperature Torque
ASTM D2266	Grease, Lubricating, Wear Preventive Characteristics of (Four-Ball Method)
ASTM D2596	Lubricating Grease, Measurement of Extreme Pressure Properties of (Four-Ball Method)
ASTM D4057	Manual Sampling of Petroleum and Petroleum Products, Practice for

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other information services.)

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 Material. The grease shall be a homogeneous mixture of base fluids, thickener(s), and additives as necessary. A formulation of polyol aliphatic ester, a fluorinated polysiloxane, a sodium montmorillonite clay, fluorinated ethylene propylene copolymer, antimony dialkyldithiocarbamate, and other additives as necessary is recommended but is not mandatory.

3.2 Grease properties.

3.2.1 Penetration, unworked. The unworked penetration of the grease shall not be more than 340 when tested as specified in 4.4.1.

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3.2.2 Penetration worked. The worked penetration of the grease shall not be more than 340 when tested as specified in 4.4.1.

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 4.4.1.

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 4.4.1.

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 4.4.1.

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 4.4.1.

3.2.7 Steel on steel wear. When tested as specified in 4.4.1 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 maximum
AISI-C-52100 Steel	4 hours	Ambient	1.30 maximum

3.2.8 Low temperature torque. A Number 204 open ball bearing lubricated with 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 4.4.1.

3.2.9 Storage stability. After storing for six months as specified in 4.4.3 the worked penetration of the grease shall not have changed from the original work 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 4.4.2.

4. VERIFICATION

4.1 Sampling. Sampling shall be in accordance with *ASTM D4057*.

4.2 Inspection. Inspection shall be in accordance with *FED-STD-791, Method 9601*.

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

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4.3.1 Acceptance tests. Tests for acceptance of individual bulk or packaged lots (see 6.6) shall consist of tests for worked penetration, evaporation, and steel on steel wear at 167 °F (75 °C) for 2 hours.

4.4 Test procedures.

4.4.1 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 4.4.2 and 4.4.3.

TABLE II. Test methods

Test	FED-STD-791 Method ^{1/}	ASTM
Penetration	311.7	D217
Worked stability	313.2	D217
Evaporation	351.2 ^{2/}	D972
Oil separation	321.2 ^{2/}	
Load wear index		D2596
Steel on steel wear	3/	D2266
Low temperature torque	334 ^{4/}	D1478

^{1/}The test temperature shall be 300 °F (149 °C).

^{2/}The test temperature shall be -65 °F ±5 °F (-54 °C ±3 °C).

4.4.2 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.

4.4.3 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 6 months subsequent to the original determination of the penetration. The worked and unworked penetrations after storage shall be determined in accordance with *FED-STD-791, Method 311*.

5. PACKAGING

5.1 Packaging and packing. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging 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 with 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.

MIL-PRF-83363C**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 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 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 2.1).
- c. Packaging requirements (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 Number 73603.

6.4 International standardization agreements. Certain provisions of this specification are the subject of international standardization agreement, *NATO Code Number G-396*. When amendment, revision, or cancellation of this specification is proposed that 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 Responsible engineering office. The office responsible for development and technical maintenance of this standard is AFRL/MLSE, BLDG 652, 2179 12th St, Room 122, Wright-Patterson AFB OH 45433-7718. Requests for additional information or assistance on this standard can be obtained from AFRL/MLSE. Any information obtained relating to Government contracts must be obtained through contracting officers.

6.6 Definitions

6.6.1 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.

6.6.2 Packaged lot. An indefinite number of 55 gallon (208.175 liter) 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.

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6.7 Subject term (key word) listing.

extreme pressure grease

grease

helicopter transmission

6.8 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. The changes are due to Acquisition Reform initiatives requiring Government specifications to be performance-based.

Custodian:

Army – CR4

Navy - AS

Air Force - 11

DLA – GS

Preparing Activity:

Air Force - 11

(Project 9150-0824)

Review activities:

Air Force – 68

Army - MI

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 document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-PRF-83363C

2. DOCUMENT DATE (YYMMDD)
98/02/20

3. DOCUMENT TITLE

GREASE, TRANSMISSION, HELICOPTER

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, Middle Initial)

b. ORGANIZATION

c. ADDRESS (include Zip Code)

d. TELEPHONE (Include Area Code
(1) Commercial

e. DATE SUBMITTED
(YYMMDD)

(2) AUTOVON
(if applicable)

8. PREPARING ACTIVITY

a. NAME

ASC/ENSI
Air Force Code 11

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(937) 255-0175

(2) AUTOVON
785-0175

c. ADDRESS (Include Zip Code)

2530 Loop Road West
Wright-Patterson AFB OH 45433-7101

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