SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3057 REV. A

Issued 2000-05
Stabilized 2012-02

Superseding AMS3057

Lubricant, Semi-Fluid, for Aircraft Gearboxes

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by SAE AMS M, Aerospace Greases Committee, and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

1. SCOPE:

1.1 Form:

This specification covers semi-fluid lubricant suitable for use in aircraft gearboxes and transmissions.

1.2 Application:

This product has been used typically for lubricating transmissions in wing slat/flap actuators in certain aircraft, and other mechanisms, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 942 Oxidation Stability of Lubricating Greases by the Oxygen Bomb Method

2.2 ISO Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002, and from Beuth Verlag GmbH, Burggrafenstrasse 6, D-10787 Berlin, Germany.

ISO 1817	Elastomers; Determination of the Resistance to Liquids
ISO 10337	Testing of Mineral Oil Hydrocarbons and Solvents; Determination of Water Content According to Karl Fischer; Indirect Method
ISO 14596	Mineral Oils and Fuels; Determination of Sulfur Content (Total Sulfur); Analysis by Wavelength Dispersive X-Ray Spectrometry (XRS)

2.3 DIN Publications:

Available from Beuth Verlag GmbH, Burggrafenstrasse 6, D-10787 Berlin, Germany.

DIN 50017	Climates and Their Technical Application; Condensated Water Containing Climates
DIN 51363-2	Testing of Mineral Oils; Determination of Phosphorus Content of Lubrication Oils and Additives; Analysis by X-ray Spectrometry (XRS)
DIN 51391-2	Testing of Lubricants; Determination of the Content of Additive Elements; Analysis by Wavelength Dispersive X-ray Spectrometry (XRS)
DIN 51398	Testing of Lubricants; Procedure for Measurement of Low Temperature Apparent Viscosity by Means of the Brookfield Viscometer (Liquid Bath Method)
DIN 51808	Testing of Lubricants; Determination of Oxidation Stability of Greases; Oxygen Method

2.4 CEC Publications:

Available from SAE Order Department 782, 400 Commonwealth Drive, Warrendale, PA 15096, USA (outside Europe), and from CEC Secretariat, Madou Plaza, 25th Floor, Place Madou 1, B-1210 Brussels, Belgium (within Europe).

CEC-L-07-A-95	Load Carrying Capacity Test for Transmission Lubricants (FZG Gear Machine)
CEC-L-45-A-99	Viscosity Shear Stability of transmission lubricants (Taper Roller Bearing Rig)

2.5 Liebherr Publications:

Available from Liebherr Aerospace Lindenberg GmbH, Depm. EB, P.O. Box 1363, D-88153 Lindenberg – Germany.

PA-697510-01	Actuator typ A
PA 697511-02	Actuator typ B

3. TECHNICAL REQUIREMENTS:

3.1 Materials:

This semi-fluid lubricant shall consist of a diester base fluid thickened with a lithium stearate soap and other suitable additives (corrosion protection, EP additives). (See 8.1).

3.2 Properties:

The lubricant shall conform to the requirements shown in Table 1, determined in accordance with test methods as defined in Table 1.

TABLE 1 - Properties

Paragraph	Property	Requirement	Test Method
3.2.1	Appearance	Smooth homogenous uniform appearance, free from lumps, abrasive materials and undesirable fillers and impurities	Visual examination
3.2.2	Viscosity, At 20 °C (68 °F)	1.5 to 2.7 Pa·s (1500 to 2700 centipoise)	4.6.1
3.2.3	Viscosity, Low Temperature, max, at -56 °C (-69 °F)	1000 Pa·s (10,000 poise)	4.6.1
3.2.4	Shear Stability		CEC-L-45-A-99 (The adaptor per App. 1 must be used.)
	Viscosity after 1 hour Viscosity after 20 hours	1.5 to 2.7 Pa·s (1500 to 2700 centipoise) 1.2 to 2.7 Pa·s (1200 to 2700 centipoise)	4.6.1 4.6.1
3.2.5	Separation after 168 hours, max	10 mg/cm^2	4.6.2
3.2.6	Water Content, max	1500 mg/kg	ISO 10337
3.2.7	Infrared Spectrum	Identical to qualification sample	-
3.2.8	Additive Concentration as analyzed by elements, ppm: Phosphorus Sulfur Calcium	Qualification sample value ±20%	X-ray-spectrometry: P: DIN 51363-2 S: ISO 14596 Ca: DIN 51391-2
3.2.9	Volume Change at 10 kPa (1.45 psia), max	50%	4.6.3