



AEROSPACE MATERIAL SPECIFICATION

AMS3054™

REV. C

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Stabilized 2016-02

Superseding AMS3054B

Oil, Lubricating, Low Temperature
For -55 °C (-67 °F) Service

RATIONALE

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Documents

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1. SCOPE:

1.1 Form:

This specification covers a petroleum-base lubricating oil.

1.2 Application:

This lubricant has been used typically for general purpose, low-temperature lubrication applications where low evaporation and rust-preventive characteristics are desired, 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 forms 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 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2759/2	Heat Treatment, of Low-Alloy Steel Parts, Minimum Tensile Strength 220 ksi (1515 MPa) and Higher
AMS 4037	Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn, (2024; T3 Flat Sheet, -T351 Plate), Solution Heat Treated
AMS 4377	Magnesium Alloy Sheet and Plate, 3.0Al - 1.0Zn, 0.20Mn (AZ31B-H24), Cold Rolled and Partially Annealed
AMS 4500	Copper Sheet, Strip, and Plate, Soft Annealed
AMS 4507	Copper Alloy (Brass) Sheet, Strip, and Plate, 70Cu - 30Zn, Half Hard (H02)
AMS 5040	Steel Sheet and Strip, 0.15 max Carbon, Deep Forming Grade
AMS 6440	Steel Bars, Forgings, and Tubing, 1.45Cr (0.98 - 1.10C), (SAE 52100), For Bearing Applications

2.2 ASTM Publications:

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

ASTM D 91	Precipitation Number of Lubricating Oils
ASTM D 92	Flash and Fire Points by Cleveland Open Cup
ASTM D 97	Pour Point of Petroleum Products
ASTM D 130	Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
ASTM D 445	Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)
ASTM D 664	Acid Number of Petroleum Products by Potentiometric Titration
ASTM D 972	Evaporation Loss of Lubricating Greases and Oils
ASTM D 1500	ASTM Color of Petroleum Products (ASTM Color Scale)
ASTM D 1748	Rust Protection by Metal Preservatives in the Humidity Cabinet

2.3 ANSI Publications:

Available from ANSI, 1430 Broadway, New York, NY 10018.

ASME B46.1 Surface Texture

3. TECHNICAL REQUIREMENTS:

3.1 Material:

The oil shall be a fraction of refined crude petroleum, containing additives imparting corrosion protective and oxidation resisting properties, meeting the requirements of 3.2.

3.2 Properties:

The oil shall conform to the following requirements, determined in accordance with specified test methods, insofar as practicable:

- 3.2.1 Color and Appearance: The oil shall be clear, transparent, and uniform in appearance and not darker than No. 5 (ASTM Color Scale), determined in accordance with ASTM D 1500.
- 3.2.2 Kinematic Viscosity: Shall conform to the values shown in Table 1, determined in accordance with ASTM D 445:

TABLE 1 - Kinematic Viscosity

Temperature, ± 1 °C (± 2 °F)	Value, centistokes (mm^2/s), max
38 °C (100 °F)	10
-40 °C (-40 °F)	4000

- 3.2.3 Flash Point: Shall be not lower than 130 °C (266 °F), determined in accordance with ASTM D 92 on the preproduction sample. Tests on subsequent lots for acceptance testing shall not differ from the preproduction flash point value by more than ± 6 C (± 10 F) degrees.
- 3.2.4 Pour Point: Shall be -57 °C (-71 °F) or below, determined in accordance with ASTM D 97.
- 3.2.5 Precipitation Number: Shall be 0.00, determined in accordance with ASTM D 91.
- 3.2.6 Corrosion: Shall be not greater than Class 1, determined in accordance with ASTM D 130 at 100 °C ± 1 (212 °F ± 2) for 3 hours ± 0.1 .
- 3.2.7 Evaporation: Weight loss shall not exceed 22%, determined in accordance with ASTM D 972.
- 3.2.8 Humidity Resistance: Not more than one panel out of five, covered with a film of the lubricating oil and subjected to humidity testing in accordance with ASTM D 1748 for 100 hours ± 0.25 , using the same steel and thickness of test panel as in 4.5.1.2, shall exhibit either a dot of rust larger than 2 mm in diameter or two or more dots of rust larger than 1 mm in diameter on the significant area of the panel.
- 3.2.9 Corrosion and Oxidation Stability: The oil shall comply with the following requirements, determined in accordance with 4.5.1:
 - 3.2.9.1 Corrosion: The change in weight of metal test specimens shall not exceed ± 0.2 mg/cm² of surface for each specimen. There shall be no pitting, etching, or visible corrosion on the surfaces of any of the metals when examined at approximately 20X magnification. Slight discoloration of surfaces of the copper and cadmium specimens is permissible.