

AEROSPACE MATERIAL SPECIFICATION

FLUID, REFERENCE FOR TESTING POLYOL ESTER (AND DIESTER) RESISTANT MATERIAL

1. SCOPE:

1.1 Form:

This specification covers a trimethylol propane triheptanoate fluid (See 8.1) representative of gas turbine engine oils.

1.2 Application:

This fluid has been used typically to evaluate the ability of elastomeric and other polymeric materials to conform to designated requirements after contact with, or immersion in, MIL-L-7808 and similar lubricants at specified time and temperature as required by the material specification, and its use is limited to such applications. This fluid is not intended for operational use in gas turbine engines (See 8.1).

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 following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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2.1 SAE Publications:

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

AMS 2825	Material Safety Data Sheets
AMS 3217/4	Test Slabs, Fluoroelastomer (FKM), 65-75

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 445	Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D 471	Rubber Property - Effect of Liquids
ASTM D 974	Neutralization Number by Color-Indicator Titration
ASTM D 1298	Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
ASTM D 1744	Water in Liquid Petroleum Products by Karl Fischer Reagent
ASTM D 4057	Manual Sampling of Petroleum and Petroleum Products

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-STD-2073-1	DOD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Fluid shall consist of a refined ester base stock and commercial additives to the percentages by weight shown in Table 1. Conformance to Table 2 and Table 3 shall be used in lieu of chemical analysis to validate composition (See 8.2).

TABLE 1 - Composition

Component	min	max
Trimethylol Propane Triheptanoate	95.9	96.1
Tricresyl Phosphate	1.9	2.1
Phenyl-alpha-naphthyl-amine	0.9	1.1
P, P' Dioctyl Diphenylamine	0.9	1.1

3.2 Properties:

The product shall conform to requirements shown in Table 2; tests shall be performed on the fluid supplied and in accordance with specified test methods.

TABLE 2 - Properties

	Property	Requirement	Test Method
3.2.1	Specific Gravity 16 /16 °C (60 /60 °F)	0.964 ± 0.010	ASTM D 1298
3.2.2	Viscosity 38 °C (100 °F) 100 °C (212 °F)	14.5 cSt ± 0.5 3.5 cSt ± 0.25	ASTM D 445
3.2.3	Total Acid Number	0.05 mg KOH/g ± 0.05	ASTM D 974
3.2.4	Total Water	500 ppm, max	ASTM D 1744

- 3.2.5 Elastomer Compatibility: Tests shall be conducted on standard fluorocarbon elastomer stock (FKM), AMS 3217/4, aged in fluid at 200 °C ± 3 (392 °F ± 5) for 70 hours ± 5. Properties shall be determined in accordance with ASTM D 471.

TABLE 3 - Elastomer Compatibility

Property	Requirement
Volume Change	+1 to +25%
Tensile Strength Decrease, max	35%
Elongation Decrease, max	20%
Hardness Change	+0 to -15 points

3.3 Quality:

The fluid, as received by purchaser, shall be uniform in quality and condition, and free from sediment, suspended matter, and other foreign materials.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The manufacturer of the fluid shall supply all samples and shall be responsible for required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the fluid conforms to the requirements of this specification.

4.2 Classification of Tests:

All technical requirements are acceptance tests and shall be performed on each lot prior to shipment of fluid by the manufacturer.

4.3 Sampling and Testing:

Shall be in accordance with ASTM D 4057. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1 A lot shall be all fluid from one batch presented for manufacturer's inspection at one time.

4.4 Approval:

If requested by purchaser, sample fluid shall be submitted for approval by the purchaser before fluid for production use is supplied. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample fluid (See 8.5). Production fluid made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

The supplier of the product shall furnish with each shipment a report from the manufacturer showing the composition and the results of tests to determine conformance to the technical requirements and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 3023, manufacturer's identification, and quantity.

4.5.1 A material safety data sheet conforming to AMS 2825, or equivalent, shall be supplied to each purchaser prior to, or with the first shipment of the fluid.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 A lot of fluid may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.

5.1.2 The fluid shall be packaged in airtight containers of such size and design as to keep ullage to a minimum.

5.1.3 Each container of fluid shall be legibly identified, with not less than the following information on an attached label, using characters which will not be obliterated by normal handling.