

INCH-POUND

MIL-PRF-38299C(USAF)

03 October 97

SUPERSEDING

MIL-F-38299B(USAF)

14 December 1972

**PERFORMANCE SPECIFICATION****FLUID, PURGING, FOR PRESERVING FUEL TANKS OF JET AIRCRAFT**

This specification is approved for use by the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense.

**1. SCOPE**

1.1 Scope. This specification covers the requirements for a fluid for use in purging and preserving fuel tanks of jet aircraft before hanging of aircraft for scheduled maintenance.

**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 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 list, document users are cautioned that they must meet all the requirements of the specified 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 SA-ALC/SFSP, 1014 Billy Mitchell Blvd./Ste 1, Kelly AFB TX 78241-5603, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 6850

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## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

MIL-PRF-5624     Turbine Fuel, Aviation, Grades JP-4 and JP-5  
 MIL-T-83133     Turbine Fuels, Aviation, Kerosene Types,  
                      NATO F-34 (JP-8) and NATO(F-35)

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 non-Government documents which are current on the date of the solicitation.

## American Society for Testing and Materials (ASTM)

- ASTM D 86 - Method for Distillation of Petroleum Products (DoD adopted)
- ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Tester
- ASTM D 130 - Methods for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test (DoD adopted)
- ASTM D 156 - Test Method for Saybolt Color of Petroleum Products (Saybolt Chronometer Method) (DoD adopted)
- ASTM D 240 - Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter
- ASTM D 381 - Test Method for Existent Gum in Fuels by Jet Evaporation (DoD adopted)
- ASTM D 445 - Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity) (DoD adopted)
- ASTM D 1266 - Standard Test Method for Sulfur in Petroleum Products (Lamp Method)
- ASTM D 1298 - Test Method for Density, Relative Density, (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method (DoD adopted)
- ASTM D 1319 - Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption (DoD adopted)
- ASTM D 2276 - Test Method for Particulate Contaminant in Aviation Turbine Fuels (DoD adopted)

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- ASTM D 2386 - Test Method for Freezing Point of Aviation Fuels (DoD adopted)
- ASTM D 2624 - Standard Test Methods for Electrical Conductivity of Aviation and Distillate Fuels
- ASTM D 3227 - Test Method for Mercaptan Sulfur in Gasoline, Kerosene, Aviation Turbine, and Distillate Fuels (Potentiometric Method) (DoD adopted)
- ASTM D 3242 - Test Method for Total Acidity in Aviation Turbine Fuel (DoD adopted)
- ASTM D 4057 - Practice for Manual Sampling of Petroleum and Petroleum Products (DoD adopted)
- ASTM D 4308 - Standard Test Method for Electrical Conductivity of Liquid Hydrocarbons by Precision Meter
- ASTM D 4952 - Test Method for Quantitative Analysis for Active Sulfur Species in Fuels and Solvents (Doctor Test)
- ASTM E 29 - Recommended Practice for Indicating Which Places of Figures are to be Considered Significant in Specified Limiting Values (DoD adopted)

(Application for copies of ASTM documents should be addressed to the American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken 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 informational 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 Materials. The purging fluid shall consist completely of hydrocarbon compounds except as specified herein. Virgin, recycled or reclaimed petroleum may be used.

3.2 Chemical and Physical Requirements. The product shall conform to the requirements as specified in Table I. Requirements in Table I are absolute and not subject to correction for tolerance of test methods. However, if multiple determinations are made, those results falling within the tolerance of the test method shall be averaged.

3.3 Workmanship. The purging fluid shall be free from undissolved water, sediment, and suspended matter.

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TABLE I. Chemical and Physical Requirements and Test Methods.

Requirements	Minimum	Maximum	ASTM Test Method
Distillation			D 86
Initial Boiling Point, °C (°F)	218.3 (425)		
Recovered 10%, °C (°F)	1/		
Recovered 50%, °C (°F)	1/		
Recovered 90%, °C (°F)	1/		
End Point, °C (°F)		315.6 (600)	
Residue, Vol%		2.0	
Loss, Vol%		1.5	
Specific Gravity, 60/60°F	1/	1/	D 1298
Existent Gum, mg/100ml, washed		7 3/	D 381
Total Sulfur, Wt%		0.4	D 1266
Mercaptan Sulfur, Wt% 2/		0.001	D 1319 or D 3227
Freezing Point, °C (°F)		-40 (-40)	D 2386
Net Heat of Combustion, BTU/lb	18,000		D 240
Viscosity, Centistokes @ 100°F		5.0	D 445
Aromatics, Vol%		15.0	D 1319
Flash Point, °C (°F)	93.3 (200)		D 93
Copper Strip Corrosion, 2 hr @ 100°C (212°F)	1b		D 130
Particulate Matter, mg/liter		1.0	D 2276
Total Acid Number, KOH/g		0.015	D 3242
Color, Saybolt	+20		D 156
Fuel electrical conductivity, pS/m, allowable range at ambient fluid to temperature or 29.4°C (85°F), whichever is lower	200	600	D2624 or D4308
Miscibility with MIL-PRF-5624 and MIL-T-83133	Completely miscible		

1/ To be reported, not limited

2/ The mercaptan sulfur determination may be waived at the option of the inspector if the fluid is "doctor sweet" when tested in accordance with the doctor test of ASTM D4952.

3/ The steam jet procedure for aircraft turbine fuel, in accordance with ASTM D 381, shall be used. However, following the determination of the unwashed existent gum, the residue shall be extracted with n-heptane and the washed gum determined in accordance with ASTM D 381 procedure for motor gasolines. Both unwashed and washed existent gum results shall be reported.

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3.4 Antioxidant additives. Immediately after processing, an approved antioxidant shall be added, if the purging fluid contains any blending stocks that have been hydrogen-treated. For fluids that do not contain hydrogen-treated blending stocks, the use of an antioxidant is optional. Approved antioxidants and concentrations shall be the same as for JP-4 fuel in accordance with MIL-PRF-5624.

3.5 Electrical Conductivity Additive. An electrical conductivity additive shall be added to the purging fluid in sufficient concentration to increase the conductivity of the fluid to within the range of 200 to 600 picosiemens per meter.

3.6 Toxicity. The finished purging fluid shall have no adverse effect on the health of personnel when used for its intended purpose. The fluid shall contain no components which produce noxious vapors in such concentrations that would cause physical irritation to personnel during use or formulation under conditions of adequate ventilation.

3.7 Limiting Values. The following applies to all specified limits in this performance specification: For the purposes of determining conformance with these requirements, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit according to the rounding-off method of ASTM Practice E 29 for using Significant Digits in Test Data to Determine Conformance with Specifications.

#### 4. VERIFICATION

4.1 Points of Inspection. 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 (examination and test) as 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 ensure supplies and services conform to prescribed requirements.

4.2 Conformance Inspection. Inspections of individual lots will serve as a basis for acceptance and shall consist of all the examinations and tests specified in section 3. Use the chemical and physical requirements and applicable test methods as specified in Table I for conformance testing.

#### 4.3 Lot Definitions.

a. Bulk Lot of Material. An indefinite quantity of a homogenous mixture of material contained in one isolated tank or kettle which is greater than 55 gallons in size, or a quantity manufactured by a single plant through the same processing equipment during one continuous operation not exceeding a 24-hour period.

b. Packaged Lot of Material. A container lot of material shall be defined as an indefinite number of 55-gallon drums or smaller unit containers of identical size and type, filled with a homogeneous mixture of material manufactured by a single plant run through the same processing equipment during one continuous operation not exceeding a 24 hour period.

4.4 Sample. Each sample shall be of sufficient size to conduct all the quality conformance tests as specified herein. Unless otherwise



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6.4 Subject Terms (Key word listing)

Petroleum fluid  
Preservation fluid  
Purging  
Antioxidant  
Fuel tanks

6.5 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.

Custodian:  
Air Force - 68

Preparing activity:  
Air Force - 68

Reviewer activities:  
Air Force - 11

(Project 6850-1206)

# 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.

<b>I RECOMMEND A CHANGE:</b>		1. DOCUMENT NUMBER MIL-PRF-38299C	2. DOCUMENT DATE (YYMMDD) 971003
3. DOCUMENT TITLE Fluid, Purging, For Preserving Fuel Tanks of Jet Aircraft			
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, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME SA-ALC/SFSP		b. TELEPHONE (Include Area Code) (1) Commercial (210) 925-7847 (2) AUTOVON 945-7847	
c. ADDRESS (Include Zip Code) 1014 Billy Mitchell Blvd, STE 1 Kelly AFB, TX 78241-5603		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	