

MIL-STD-457A
1 March 1977-
Superseding
MIL-STD-457
10 November 1970

MILITARY STANDARD

FREQUENCY FOR INSPECTION AND CLEANING OF PETROLEUM
FUEL OPERATING AND STORAGE TANKS.



FSC 9130
FSC 9140

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1 March 1977

DEPARTMENT OF DEFENSE
WASHINGTON, D. C.

Frequency for Inspection and
Cleaning of Petroleum Fuel
Operating and Storage Tanks
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1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense.

2. Recommended corrections, additions, or deletions should be addressed to the Defense Fuel Supply Center, Defense Supply Agency, Cameron Station, Alexandria, Virginia 22314.

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1. SCOPE

1.1 Purpose. The purpose of this standard is to establish uniform criteria for determining the need for, and frequency of, interior inspection and cleaning of bulk fuel tanks utilized in storing and dispensing military petroleum fuels.

1.2. Application. The criteria established by this standard will apply to all fixed petroleum tankage at all U.S. military activities worldwide. The standard will also apply to Government-owned/contractor-operated (GOCO) terminals and to contractor-owned/contractor-operated (COCO) tankage storing and dispensing Government-owned petroleum fuels.

2. REFERENCED DOCUMENTS

2.1. The following documents form a part of this standard to the extent specified herein.

Military Specifications

MIL-F-859, Fuel Oil, Burner
MIL-F-16884, Fuel Oil, Diesel, Marine
MIL-G-3056, Gasoline, Automotive, Combat
MIL-G-5572, Gasoline, Aviation, Grades 80/87, 100/130, 115/145
MIL-T-5624, Turbine Fuel, Aviation, Grades JP-4 and JP-5

Military Standards

MIL-HDBK-200, Quality Surveillance Handbook for Fuels, Lubricants and Related Products

Federal Specifications

VV-F-800, Fuel Oil, Diesel
VV-F-815, Fuel Oil, Burner
VV-G-76, Gasoline, Automotive
VV-G-001690, Gasoline, Automotive, Low Lead or Unleaded

Commercial Publications

ASTM, Part 23, Method ASTM D-270, Sampling Petroleum and Petroleum Products
ASTM, Part 24, Method ASTM D-2276, Particulate Contaminant in Aviation Fuels

3. DEFINITIONS

3.1 Operating Tank. A fixed tank in a system dispensing fuel directly to military equipment.

3.2 Bulk Storage Tank. A fixed tank utilized to receive, store and issue fuel other than directly to military equipment.

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3.3 Interior Tank Inspection.

3.3.1 Visual Inspection. The inspection of the interior of a tank from the manway opening or by any other suitable means without actual physical entry into the tank. This type of inspection requires only a few manhours of effort to accomplish.

3.3.2 Physical Entry Inspection. The inspection of the interior of a tank by physical entry into the tank. Preparation of the tank for entry shall be that required for the protection and safety of inspection personnel in accordance with existing departmental instructions.

3.4 Aviation Fuels. The term "aviation fuels" applies only to those fuels conforming to the basic requirements of specification MIL-T-5624, Turbine Fuel, Aviation, Grades JP-4 and JP-5, and MIL-G-5572, Gasoline, Aviation, Grades 80-87, 160/130, 115/145. Inclusion of commercial type aircraft turbine fuels and unconventional fuels is optional.

3.5 Ground and Marine Fuels. Pertains to those fuels conforming to the basic requirements of specification MIL-F-16884, Fuel Oil, Diesel, Marine; MIL-G-3056, Gasoline, Automotive, Combat, Types I and II; VV-F-800, Fuel Oil, Diesel, Grades DFA, DF-1, and DF-2; VV-G-76, Gasoline, Automotive, Types Premium and Regular; and VV-G-001690, Gasoline, Automotive, Low Lead or Unleaded, Grades Premium, Regular and Special.

3.6 Burner Fuels. The term applies to those fuels conforming to the basic requirements of specification MIL-F-859, Fuel Oil, Burner and VV-G-815, Fuel Oil, Burner, Grades 1, 2, 4, 5 (Light and Heavy) and 6.

4. GENERAL REQUIREMENTS

4.1 General Considerations.

a. For aviation fuel tanks one of two options specified in paragraph 5 shall be used to determine the need for and extent of tank cleaning. Option A is by interior inspection on a recurrent periodic basis. Option B is to determine the need for interior inspection utilizing product sampling, testing and data analysis techniques.

b. Although no differentiation between a newly constructed tank or a recently cleaned tank is made, the product sampling and testing option may, at the discretion of the using service, be accomplished at a less frequent rate than specified herein during any initial six month period.

c. The standard does not cover nor apply to required interior inspections or cleaning due to needed tank repairs because of leaks, suspected internal structural failures, tank modifications, change of product or gross fuel contamination from outside sources.

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5. DETAILED REQUIREMENTS

5.1 Aviation Fuel Tanks.

5.1.1 Option A - Interior Inspection.

a. Visual Inspection. Operating and bulk storage tanks shall be visually inspected (defined in paragraph 3.3.1) as prescribed below:

(1) Annually on an uncoated tank where incoming fuel does not pass through a filter separator just prior to delivery into the tank.

(2) Every two years on an uncoated tank where incoming fuel is passed through a filter separator just prior to delivery into the tank.

(3) Every two years on tanks that are coated where incoming fuel does not pass through a filter separator just prior to delivery into the tank.

(4) Every three years on tanks which are coated and the incoming fuel passes through a filter separator just prior to delivery into the tank.

b. Physical Entry Inspection. Operating and bulk storage tanks shall be inspected by physical entry (defined in paragraph 3.3.2) as prescribed below:

(1) Every three years on an uncoated tank where incoming fuel does not pass through a filter separator just prior to delivery into the tank.

(2) Every four years on an uncoated tank where incoming fuel is passed through a filter separator just prior to delivery into the tank.

(3) Every four years on tanks which are coated where incoming fuel does not pass through a filter separator just prior to delivery into the tank.

(4) Every six years for tanks which are coated and the incoming fuel passes through a filter separator just prior to delivery into the tank.

5.1.2 Option B - Sampling and Testing.

a. Operating Tanks. A sample representative of product in each operating tank shall be obtained on a monthly basis or more frequently if necessary. It is preferable that samples be taken downstream from the discharge side of the tank and prior to any filtration action. As an alternate, an average sample may be taken from the tank in accordance with ASTM Method D-270, Sampling of Petroleum and Petroleum Products. The particulate content of the sample shall be determined as prescribed in ASTM Method D-2276, Particulate Contamination of Aviation fuels.

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b. Bulk Storage Tanks. An average sample of product shall be obtained in accordance with ASTM Method D-270 at a frequency of not less than 30 days minimum for active storage and 180 days minimum for inactive storage or after a tank is replenished with new product. The particulate content of the sample shall be determined in accordance with ASTM Method D-2276.

c. Bottom Samples. A bottom sample taken at a frequency and in a manner prescribed by the individual Services will be analyzed for sludge characteristics and evidence of any other contamination problems.

5.2 Ground and Marine Fuels.

5.2.1 Sampling and Testing. The minimum sampling frequency for all ground and marine fuels in bulk storage and operating tanks shall be as specified in MIL-HDBK-200, Quality Surveillance Handbook for Fuels, Lubricants and Related Products. This frequency may be increased to cover product replenishment and to provide for increased sampling of clean products. All samples shall be obtained as prescribed in ASTM Method D-270. Bottom samples of all product tanks, particularly in the case of residual fuels, should be obtained at a frequency specified by each Service. Samples shall be tested for those product characteristics which will indicate an unsatisfactory interior tank condition, i.e., excessive rusting and sludging, deteriorating tank lining, etc.

5.3 Particulate Matter in Fuels. The following limitations are suggested as a guide at Defense Fuel Support Points, however, specific military service requirements applicable to Army, Navy or Air Force installations will be strictly adhered to:

Turbine Fuel	1.0 mg/l
Avgas	2.0 mg/l
Diesel Fuel	8.0 mg/l

6. INTERIOR TANK INSPECTIONS AND CLEANING

6.1 Aviation Fuel Tanks.

6.1.1 Option A.

a. Operating Tanks. When visual inspection as specified in paragraph 5.1.1a reveals a deteriorating condition of any nature within the tank which could affect product quality or result in future excessive maintenance costs if uncorrected, inspection by physical entry to verify the condition(s) and to clean the tank to the extent necessary, shall be accomplished.

b. Bulk Storage Tanks. Interior tank cleaning and maintenance shall be accomplished to the extent necessary as indicated by the periodic inspections performed in accordance with paragraph 5.1.1b.

6.1.2 Option B.

a. Operating and Bulk Storage Tanks. Interior inspection of any operating or bulk storage tank by physical entry shall be accomplished when an evaluation of the data gathered as prescribed by paragraph 5.1.2 reveals that the particulate content of the specific product is approaching or exceeds the deterioration limit established by each individual Service. This indication may occur rapidly or stretch out over a number

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of years. Other indicators which should be considered in a decision to inspect the interior of a tank are the analyses of bottom samples taken as specified in paragraph 5.1.2 and any abnormal operation of filter separators. At the discretion of the individual Service, inspection by physical entry may be made when a bottom sample indicates a developing microbial problem. Cleaning to the extent necessary shall be accomplished subsequent to and based on the observations resulting from interior inspections.

6.1.3 Ground and Marine Fuels.

a. Physical entry into operating tanks, where feasible, and bulk storage tanks to determine the need for and extent of cleaning necessary shall be accomplished when product characteristics on samples obtained and tested as specified in paragraph 5.2.1 approach or exceed the deterioration limits established in MIL-HDBK-200. In addition, tank entry for inspection purposes may be accomplished at any time tank conditions, i.e., evidence of excessive interior rusting or liner deterioration, a possible microbial problem and amount or type of bottom sludge, creates a reasonable doubt as to the ability of the tank to maintain the quality integrity of the product being stored or issued.

7. RECORDS

7.1 History Cards. Each activity as defined by paragraph 1.2 will maintain a comprehensive card history on file, applicable to each storage and operating tank citing all actions taken as required by this standard.

8. IMPLEMENTATION

8.1 Each Service shall specify the option(s) permitted herein and shall ensure that the standard and the options selected are implemented by all concerned field operating activities and personnel.

Preparing Activity:

DSA - PS

Custodians:

Army - ME
Navy - SA
Air Force - 04

Review Activities:

Army - CE, MR
Air Force - 68
Navy - SA

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