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PERFORMANCE SPECIFICATION

# TANKS, COLLAPSIBLE, 3,000, 10,000, 20,000, 50,000, & 210,000 U.S. GALLONS, FUEL

## 1. SCOPE

1.1 Scope. This performance specification covers 3,000, 10,000, 20,000, 50,000, and 210,000 U.S. gallon capacity, collapsible fuel storage tank assemblies. These tank assemblies are military-unique and expected to interface with existing fuel distribution systems and perform as specified in extreme operating terrain and climates. The rigors of the battlefield require a fuel distribution system having capabilities exceeding those of commercially available items in areas of safety, durability, and range of performance.

1.2 Classification. Tanks will be of the following sizes as specified (see 6.2).

Size I: 3,000 U.S. gallons
Size II: 10,000 U.S. gallons
Size III: 20,000 U.S. gallons
Size IV & IV-A: 50,000 U.S. gallons
Size V: 210,000 U.S. gallons

## 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 cited 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 specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed below.

2.2 Government Documents.

Comments, suggestions, or questions on this document should be addressed to the Commander, U.S. Army Tank-Automotive and Armaments Command, ATTN: RDTA-EN/STND/TRANS, MS-268, Warren, MI 48397-5000 or emailed to usarmy.detroit.rdecom.mail.tardec-standardization@mail.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil/.

AMSC N/A FSC 3835

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).

FEDERAL

| | | |
|---|---|---|
| FED-STD-595/33446 | - | Sand matte, general match or lighter |
| A-A-52022 | - | Repair Outfits, Collapsible Tanks, and Drums |
| A-A-52557 | - | Fuel Oil, Diesel; For Posts, Camps and Stations |
| A-A-59326 | - | Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specification For |

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins, Philadelphia, PA 19111-5094, or at https://assist.dla.mil/.)

DEPARTMENT OF DEFENSE

| | | |
|---|---|---|
| ATPD-2262 | - | Berm Liner Assemblies |
| ATPD-2263 | - | Repair Kit and Repair Kit Components for Collapsible Fabric Tanks and Drums |

(Unless otherwise indicated, copies of the above ATPDs are available from the office of the Contracting Officer or can be requested at usarmy.detroit.rdecom.mbx.tardec-standardization@mail.mil.)

| | | |
|---|---|---|
| MIL-DTL-83133 | - | Turbine Fuel, Aviation, Kerosene Types, NATO F-34 (JP-8) and NATO F-35, JP-8+100 |
| MIL-DTL-5624 | - | Turbine Fuel, Aviation, Grades JP-4 and JP-5 |
| MIL-PRF-370 | - | Performance Specification, Hose and Hose Assemblies, Nonmetallic: Elastomeric, Liquid Fuel |
| MIL-STD-810 | - | Department of Defense Test Method Standard for Environmental Engineering Considerations and Laboratory Tests |
| MIL-STD-130 | - | Department of Defense Standard Practice Identification Marking of U.S. Military Property |

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins, Philadelphia, PA 19111-5094, or at https://assist.dla.mil/quicksearch/.).

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 documents cited in the solicitation (see 6.2).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

| | | |
|---|---|---|
| AATCC 111 | - | Weather Resistance of Textiles: Exposure to Daylight and Weather |

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, 1 Davis Drive, P.O. Box 12215, Research Triangle Park, NC 27709-2215, or at http://www.aatcc.org/testing/methods/topical.htm)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 381 - Standard Test Method for Gum Content in Fuels by Jet Evaporation – JP Designation
ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension
ASTM D 413 - Standard Test Methods for Rubber Property Adhesion to Flexible Substrate
ASTM D 429 - Standard Test Methods for Rubber Property - Adhesion to Rigid Substrates (DoD Adopted)
ASTM D 471 - Standard Test Method for Rubber Property Effect of Liquids
ASTM D 750 - Standard Test Method for Rubber Deterioration in Carbon Arc Weathering Apparatus.
ASTM D 751 - Standard Test Methods for Coated Fabrics
ASTM D 910 - Standard Specification for Aviation Gasolines
ASTM D 1149 - Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber
ASTM D 1655 - Standard Specification for Aviation Turbine Fuels
ASTM D 5035 - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
ASTM D 4814 - Standard Specification for Automotive Spark-Ignition Engine Fuel
ASTM G 155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure on Non-Metallic Materials

(Application for copies can be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428-2959, or at www.astm.org.)

2.4 Order of Precedence. Unless otherwise noted herein or in the contract, 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 Description. The tank assembly shall consist of a collapsible tank with attached handles and fittings, accessories, berm liner, emergency and long-term repair kits, hose support pads, and tank chest, unless otherwise specified (see 6.2). The tank assembly shall be for storage of military specification fuels in accordance with 3.3.3.

3.2 First Article. When specified (see 6.2), a tank assembly (or assemblies) shall be subjected to first article inspection in accordance with 4.2.

3.3 Materials. The manufacturer shall verify that the materials used meet all of the operational and environmental requirements specified. The contractor shall verify that properties of all fabrics used during manufacture of tank assembly lots are identical to properties of fabrics used in tank assemblies provided

during first article tests. Any changes require an Engineering Change Proposal (ECP). The tank assembly shall be newly fabricated from recovered materials to the maximum extent practicable, provided the components meet all other requirements of this specification. The materials shall be of sufficient durability to meet all the requirements as specified herein. No material shall have an adverse effect on the health of personnel when used for its intended purposes.

3.3.1 Deterioration Prevention and Control. The tank assembly shall be fabricated from compatible materials, inherently corrosion resistant, or treated to provide protection against various forms of corrosion or deterioration to which they are susceptible.

3.3.2 Recycled, Recovered, or Environmentally Preferable Materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the materials meet or exceed the operational and maintenance requirements and promote economically advantageous life cycle costs. Used, rebuilt, or remanufactured components shall not be permitted.

3.3.3 Fuel compatibility. The contractor shall certify that each tank assembly is compatible for service with all of the fuels listed below. In this context, compatibility means that the tank assemblies and fabric samples meet the requirements of Tables I & II for all fuels listed except as selectively restricted for Automotive Spark-Ignition Engine Fuel.

JP-8, IAW MIL-DTL-83133
JP-5, IAW MIL-DTL-5624
Diesel Fuel, IAW A-A-52557
Automotive Spark-Ignition Engine Fuel, IAW ASTM D 4814

3.3.4 Additional Material Tests. The tank material and tank seams shall meet the requirements of TABLES I and II.

TABLE I. Characteristics of Tank Materials.

| **Test Property/Application** | **Requirements** | **Test Reference** | | **Specification Paragraph** |
|---|---|---|---|---|
| | | ASTM | AATCC | |
| Fuel contamination:<br>Existent/unwashed gum (mg/100 ml)<br>Solvent washed gum (mg/100 ml) | 20 (max)<br>5 (max) | D 381 | | 4.5.2.4 |
| Ozone Resistance | No cracks under 7X lens | D 1149 | | 4.5.2.2 |
| Diffusion rate (fl oz/sq ft/24 hr)/tank material | 0.035 (max) | | | 4.5.2.5 |

| | | | | |
|---|---|---|---|---|
| Puncture resistance (lb)/tank material | 225 (min) | D 751 | | 4.5.2.6 |
| Low temperature crease resistance/tank material | No cracking, peeling, or delamination under 7X lens | | | 4.5.2.7 |
| Breaking strength of base tank material (warp & fill) after pre-conditioning fabric with fuel extraction followed by weathering @ 1500 hr exposure at 90% ultimate elongation at break. | Meet or exceed 4.0 Safety Factor | D 750, G 155, & D 751 Procedure B | 111 Option A | 4.5.2.1, 4.5.2.3, & 4.5.2.10 |
| Breaking strength retention of base tank material (warp & fill) before and after pre-conditioning fabric with fuel extraction followed by weathering @ 1500 hr exposure at 90% ultimate elongation at break. | 90% Retention | D 750, G 155, & D 751 Procedure B | 111 Option A | 4.5.2.1, 4.5.2.3, & 4.5.2.10 |

TABLE II. Characteristics of Seams and Seam Materials.

| **Test Property/Application** | **Requirements** | **Test Reference** | | **Specification Paragraph** |
|---|---|---|---|---|
| | | ASTM | AATCC | |
| Breaking strength of base tank seamed material after pre-conditioning fabric with fuel extraction in JP-8 followed by weathering @ 1500 hrs exposure at 90% ultimate elongation at break. | Meet or exceed 4.0 Safety Factor | D 750, G 155, & D 751 Procedure B | 111 Option A | 4.5.2.1, 4.5.2.3, & 4.5.2.11 |

| | | | | |
|---|---|---|---|---|
| Dead load shear resistance under load (equivalent to the 4.0 (min) safety factor) stress while immersed in JP-8 at 160ºF for 96 hrs for each type of seam and manufacturing process utilized in the fabrication of the tank. | No visual seam separation or delamination | | | 4.5.2.9 |
| Breaking strength retention of base tank seamed material after pre-conditioning fabric with fuel extraction in JP-8 followed by weathering @ 1500 hrs exposure at 90% elongation | 85% Retention | D 750, G 155, & D 751 Procedure B | 111 Option A | 4.5.2.1, 4.5.2.3, & 4.5.2.11 |
| Peel adhesion bonded seams after pre-conditioning fabric with fuel extraction in JP-8 | 15 psi (min) | D 751 | | 4.5.2.12 |
| Seam Peel Adhesion after fuel extraction and water immersion for 28 days at 180º F | The average of not less than three specimens shall be at least 15 lb/inch of seam width. The surfaces of specimens shall not display any cracking when examined with 7X lens. | D 413 | | 4.5.2.13 |

3.4 Tank Construction.

3.4.1 Seams and Joining of Materials. All seams and any other areas of the tank where two materials are joined shall meet or exceed all the strength properties of the tank material.

3.4.2 Weight. The weight of the packaged tank assembly shall not exceed the following:

Size I, II, III, IV, and IV-A: 5,000 lbs
Size V: 10,000 lbs

3.4.3 Fittings. Each tank shall be furnished with fittings. The quantity required and location for the filler/discharge fitting, vent fitting, and drain fittings shall be as shown in FIGURES A1, A2, and A3. The bond between fittings and tank shall meet or exceed all the properties of the un-seamed tank material. All fittings as well as the interface between the tank material and the fittings shall be capable of

withstanding 150 psig of fuel pressure without leaking and while maintaining a leak free configuration for the life of the tank.

3.4.3.1 Filler/Discharge Fitting. The male coupling halves (terminating ends) and coupling half caps shall be in accordance with A-A-59326 and compatible with the corresponding filler/discharge elbows and filler/discharge hose assembly accessories noted in 3.7. All fittings shall include a respective size coupling half and dust cap with chain in accordance with A-A-59326 and shall be installed with the chain tethered to the fitting and the cap. The fitting size and quantities shall be as specified below:

Size I: One 2-inch and one 4-inch male coupling half
Size II: Two 4-inch male coupling halves
Size III: Two 4-inch male coupling halves
Size IV: Two 4-inch male coupling halves
Size IV-A: Two 6-inch male coupling halves
Size V: Four 6-inch male coupling halves

3.4.3.1.1 Filler/Discharge Fitting Flow Rates. Each filler/discharge fitting shall be designed for a flow rate as specified without excessive restriction or damage to the tank. The 2-inch fittings shall be rated at 200 gallons per minute (GPM); 4-inch fittings shall be rated at 600 GPM; and 6-inch fittings shall be rated at 1200 GPM.

3.4.3.2 Drain fittings. For Sizes II through V, the tank shall be provided with a means to drain sediment, water and residual fuel. The quantity required and location for the drain fittings shall be as shown in FIGURES A1, A2, and A3. The draining capability shall interface with the drain hose accessory noted in 3.7. The drain fittings shall have a minimum 2-inch ID. The drain assembly shall not be a threaded type fitting. Each drain shall come with an installed blind flange on the drain for quick deployment where drains are not required or desired. Each collapsible tank shall be equipped with spare drain gaskets.

3.4.3.3 Vent Fitting. The tank vent shall be of a passive type design and ensure complete venting of fuel vapor in the tank and located in accordance with FIGURES A1, A2, and A3. The weight of the vent shall minimize the accumulation of water on top of the tank. The vent shall provide vapor pressure relief, be fitted with a flame arrestor, and provide protection against water or airborne contamination of the stored fuel.

3.4.4 Maximum Tank Dimensions. The new, untested, empty tank shall not exceed the following dimensions:

Size I: 14 feet x 14 feet
Size II: 22 feet x 22 feet
Size III: 30 feet x 30 feet
Size IV & IV-A: 30 feet x 75 feet
Size V: 75 feet x 75 feet

3.4.5 Handles: The tank shall include handles on all sides. Handles shall be evenly spaced 6 feet ±1 foot from each other. Attachment points of handles to tank shall be designed to keep the stress from concentrating on any point of the attaching surface to minimize the risk of the tank leaking at that point.

3.5 Performance.

3.5.1 Safety Factor. The tank shall have a rated capacity as specified below with a minimum safety factor of 4.0 times the maximum in-plane principal stress (manufacturer calculated design stress) that is dependent upon the material used and the materials' rate of degradation. This calculated safety factor shall apply throughout the minimum three year service life with exposure to all other environmental conditions contained in this specification.

3.5.2 Cycling. The tank assembly shall be capable of withstanding cycling throughout the service life.

3.5.3 Environmental. The tank assembly shall be suitable for service (operation) in ambient temperatures ranging from –25 to 140°F with continuous exposure to direct sunlight, rain, hail, sleet, snow, wind, blowing sand, and any combination thereof. The tank material and all fabricated seams shall be suitable for solar loads under ambient temperatures which may cause tank surface temperatures to be elevated higher than ambient. The tank assembly shall not be damaged when exposed to microbial growth or relative humidity of up to 100%.

3.5.4 Service life. The tank assembly shall have a service life of a minimum of 3 continuous years in environmental conditions as specified. Tank assembly shall be capable of being drained, folded and relocated a minimum of 3 times during its service life.

3.5.5 Storage life. The tank assembly shall withstand folded storage at ambient temperatures from -50 to 160°F (reference MIL-STD-810) for a minimum of 12 years, without damage or leakage when subsequently filled with fuel. The tank assembly shall not require any cleaning or maintenance when taken out of storage prior to being placed in service.

3.5.6 Tank Overload. The tank shall be designed to accept a 10% overfill condition without leaking or failure.

3.5.7 Pressurization. The tank shall be capable of withstanding an internal air pressure of 0.5 pounds per square inch gauge (psig) without evidence of leakage.

3.6 Capacity. For design purposes the tank assembly shall be capable of storing the volumes listed below without leaking.

Size I: 3,000 U.S. gallons
Size II: 10,000 U.S. gallons
Size III: 20,000 U.S. gallons
Size IV & IV-A: 50,000 U.S. gallons
Size V: 210,000 U.S. gallons

3.7 Accessories. Unless otherwise specified (see 6.2), each tank shall be provided with the accessories in the quantities shown in TABLE III. Each accessory in TABLE III shall be suitable for use in continuous contact with the fuels referenced in 3.3.3. Each assembly in TABLE III shall be provided fully assembled complete with coupling halves, dust caps and plugs conforming to A-A-59326. Plugs and caps shall be tethered. Accessories such as valves, fittings, plugs, caps, etc., shall be rated for minimum working pressure of 150 psig. Valves shall not be capable of opening or closing during flow without human operation. Hose assemblies shall be IAW MIL-PRF-370, and a Certification of Conformance (CoC) shall accompany or be attached to each hose assembly.

TABLE III. Tank Accessories.

| Item | Conformance | Size / Number | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | IV-A | V |
| Drain Hose Assembly | 2-inch ID non-collapsible. Length of hose shall be sufficient to extend 5 feet past the footprint of the tank (empty). One end shall have a matching bolted flange for connection to the collapsible tank and the other end shall be a 2-inch male coupling half. | 0 | 1 | 1 | 1 | 1 | 1 |
| | 2-inch ID non-collapsible hose, 10-feet in length with male-female coupling half ends. | 0 | 1 | 1 | 1 | 1 | 1 |
| Drain Valve Assembly | 2-inch valve with male-female coupling half ends. | 0 | 1 | 1 | 1 | 1 | 1 |
| Filler/Discharge Hose Assembly | 4-inch ID non-collapsible hose, 12-feet in length with male-female coupling half ends. | 0 | 2 | 2 | 2 | 0 | 0 |
| | 6-inch ID non-collapsible hose, 12-feet in length with male-female coupling half ends. | 0 | 0 | 0 | 0 | 2 | 4 |
| Filler/Discharge Valve Assembly | 4-inch valve with male-female coupling half ends. | 0 | 2 | 2 | 2 | 0 | 0 |
| | 6-inch valve with male-female coupling half ends. | 0 | 0 | 0 | 0 | 2 | 4 |
| Filler/Discharge Elbow (female to female) | 4-inch | 1 | 1 | 1 | 1 | 0 | 0 |
| | 6-inch | 0 | 0 | 0 | 0 | 1 | 2 |
| Filler/Discharge Elbow (female to male) | 2-inch | 1 | 0 | 0 | 0 | 0 | 0 |
| | 4-inch | 0 | 1 | 1 | 1 | 0 | 0 |
| | 6-inch | 0 | 0 | 0 | 0 | 1 | 2 |
| Consumable Items/Overpack Kit | Each tank shall contain spare/overpack consumable item(s) as required for service life. (e.g., gaskets, o-rings, nuts, bolts, etc.) | 1 | 1 | 1 | 1 | 1 | 1 |

3.8 Markings. Unless otherwise specified (see 6.2), each tank assembly shall be provided with the below markings. Additionally it shall be marked with an Item Unique Identification (IUID) in accordance with MIL-STD-130.

3.8.1 Identification. The tank shall be permanently marked in at least two opposing locations and visible at any level of fill. Identification may be stenciled directly on the tank material, but must last and be legible for the life of the tank. The following information shall be provided using 1.00 inch high (minimum) letters:

COLLAPSIBLE FUEL TANK
(Specify) U.S. GALLONS, FUEL
NSN: (Specify)
MANUFACTURER: (Specify)
DATE MANUFACTURED: (Specify month (3 letters) and year (4 numbers))
CONTRACT NO: (Specify)
LOT & SERIAL NO: (Specify)
WEIGHT EMPTY: (Specify approximate weight in pounds)

3.8.2 Warning labels. The tank shall be permanently marked with warning labels visible throughout the perimeter of the tank at any level of fill. Each label shall contain the following information using 1.00 inch high (minimum) letters, except for the word "WARNING" that shall be 2.00 inch high (minimum) letters. One label shall be placed on each side of the tank making a total of 4 labels per tank.

WARNING
DO NOT OVERFILL

OVERFILLING MAY RESULT IN PERMANENT
DAMAGE AND FAILURE OF THE TANK

MAXIMUM CAPACITY: (Specify) U.S. GALLONS

MAXIMUM TANK HEIGHT: (Specify) FEET (Specify) INCHES

3.8.3 Valve Labeling. Valves shall be permanently marked to indicate status (i.e., "OPEN" for the opened position and "CLOSED" for the closed position) as well as direction of operation for each status.

3.9 Color. Unless otherwise specified (see 6.2), the color of the exposed surfaces of the tank assembly shall be in accordance with FED-STD-595, color chip 33446 (sand matte), general match or lighter.

3.10 Rework and Repair. Reworked and repaired tank assemblies are subject to the limits provided below in 3.10.1, 3.10.2, and 3.10.3. All rework and repair shall be identified, documented, and provided to the government in electronic format.

3.10.1 Rework. Rework is defined as any process or procedure repeated to correct a defect during the manufacturing process prior to submittal for first article or conformance testing. Limited rework shall be permitted. Rework of seams shall not be greater than 1% of each continuous seam length in the tank or as limited by the accumulated totals from rework and repair as stated in 3.10.3. Individual rework areas of fabric panels shall be limited to 6.00 inches in diameter, length, or width as applicable. Rework of interfaces between fittings and tank shall be permitted, e.g., gasket, plate.

3.10.2 Repair. Repair is defined as any process or procedure performed to correct a defect during first article or conformance testing. Limited repair shall be permitted. Repair of seams shall not be greater than 1% of each continuous seam length in the tank or as limited by the accumulated totals from rework and repair as stated in 3.10.3. Individual repairs of fabric panels shall be limited to 6.00 inches in diameter, length, or width as applicable. Repair of interfaces between fittings and tank shall be permitted, e.g., gasket, plate. Any tank that is repaired due to a leak identified during the air leakage test as specified in 3.5.7 and defined in 4.5.1.1 shall be subjected to the overload test as specified in 3.5.6 and defined in 4.5.1.6 followed by the air leakage test as defined in 4.5.1.1. A defect (i.e., leak) shall not be repaired more than one time. No repairs of rework areas or previous repairs are permitted.

3.10.3. Limits of Rework and Repair. Accumulated totals from rework and repair of seams shall not exceed 1% of each continuous seam length. Accumulated totals from rework and repair of individual fabric panel defects shall not exceed the maximum numbers indicated below. These numbers apply to the combined internal and exterior surface areas of the tanks.

Size I: 4
Size II: 9
Size III: 14
Size IV & IV-A: 24
Size V: 38

3.11 Deployability. The Size I through IV (including IV-A) tank assembly shall be deployable (not including berm construction and berm liner deployment) by a maximum of 6 personnel in 20 minutes once the tank assembly is positioned inside the berm. For the Size V tank assembly, 15 personnel are permitted and the time extended to 60 minutes. Only common hand tools shall be required. Deployment of the tank assembly shall not cause it to leak.

3.12 Workmanship. The fabric-reinforced flange-type fittings shall contain no gum voids, cracks or tears that could adversely affect the strength of the assembly. All metal parts shall be clean and free of sand, dirt, scale, flux, burrs, sharp edges, and corrosion, and shall not be broken or malformed. Metal surfaces shall be smooth with edges rounded or beveled. The inside and outside of the tank shall be clean and free of foreign materials (excluding talc). Any necessary rework and repair shall meet all applicable requirements of this specification. The cemented surfaces of all spliced areas, fitting flanges, and patch-type repairs shall affect a bond that will result in strength of the cemented area not less than the strength of adjacent tank fabric. Fabric components shall be free of holes, cuts, or tears, thin, or weak areas, caused by abrasion, exposed fabric, blisters, holidays, tunnels, unadhered pockets, loose edges, or any delamination of coating.

3.13 Berm Liner. Unless otherwise specified (see 6.2), a berm liner in accordance with ATPD-2262, and of matching size, shall be furnished with each tank assembly.

3.14 Emergency Field Repair Kit. Unless otherwise specified (see 6.2), each tank assembly shall include an emergency field repair kit IAW ATPD-2263 that contains items necessary to perform on site repairs such as punctures, tears and leaks in emergency situations. The kit shall include all necessary tools to complete field repairs.

3.15 Long-Term Field Repair Kit. The contractor shall develop and make available to the government a repair kit IAW A-A-52022A that can be used to perform repairs on a tank already deployed for service without the need for special tools. The kit shall include all items necessary to perform long-term repairs of punctures, tears, and leaks at both seam locations and material panel areas. The repair kit shall be capable of performing long-term repairs and shall be capable of withstanding all environmental

conditions as documented in this specification for the original tank material and seams. The duration of the repair for stoppage of leaks shall be for a minimum of one year after application of the repair.

3.16 Hose Support Pads. Each tank assembly shall include hose support pads to support each Fill/Discharge hose size (i.e., 2 inch, 4 inch, and 6 inch) that are compatible with all fuels listed in 3.3.3. to reduce the stress on the interface between the fill/discharge fittings and the tank material.

3.17 Tank Chest. If specified (see 6.2), an aluminum lightweight tank chest shall be furnished for storage of each tank and components. The tank chest shall have provisions for handling by Material Handling Equipment (10,000-lbs forklift), personnel (when tank chest is empty), and sling lifts. The tank chest shall be capable of storing the tank, emergency repair kit, and all ancillary components (not including the berm liner). The tank chest shall have a lid that can be removed and secured without the use of tools. Tank chest shall be compatible with a standard cargo International Standard Organization (ISO) 8 feet x 8 feet x 20 feet container.

## 4. VERIFICATIONS

4.1 Classification of Inspections. Inspections are classified as follows:

First article inspection (see 4.2)
Conformance inspection (see 4.3)

4.1.1 Fabricated Samples for Inspection. Fabricated samples (FS) shall be produced using the same materials, processes, production personnel and equipment used in fabrication of the tank material and tank assembly. Laboratory samples (i.e., samples produced in a testing facility or by test or quality control personnel using production equipment) shall not be acceptable. Each tank shall include a sufficient number of fabricated samples to conduct inspection tests IAW 4.5.2. The contractor shall ensure that the fabricated samples are representative of the corresponding production tank or first article tank

4.2 First Article Inspection.

4.2.1 Tank Assembly Fabric Baseline. The contractor shall establish and report baseline properties for the fabric used to manufacture the first article tank assembly in the First Article Test Report. Additionally, the contractor shall report and maintain a record of fabric properties used post first article for comparison during conformance testing addressed in 4.3.4. and TABLE IV. Any proprietary data will be certified with a CoC.

4.2.2 Examinations. Each first article tank assembly (see 6.3) shall be examined as specified in TABLE V. Presence of any defects shall be cause for rejection.

4.2.3 Tests. Each first article tank assembly shall be tested as specified in TABLE VI. The number in the ‘First Article Sequence’ column specifies the order in which the corresponding test shall be performed. An ‘X’ indicates the corresponding test can be performed in any order. ‘FS’ indicates Fabricated Samples as specified in 4.1.1. The actual test to be performed is listed in the ‘Test’ and ‘Test Paragraph’ columns. Failure of any test shall be cause for rejection.

4.2.4 Safety Factor. The manufacturer shall provide a finite element analysis to determine the highest stress point(s) on the tank and the safety factor shall be based on this analysis IAW 3.5.1.

4.3 Conformance Inspection.

4.3.1 Inspection Lot. The lot size shall be a government determined quantity of tank assemblies (per tank size) manufactured successively. The assigned Government representative will randomly select a tank assembly for conformance inspection. The following maximum lot sizes are designated for each size tank assembly:

Size I: 25 tank assemblies
Size II: 25 tank assemblies
Size III: 25 tank assemblies
Size IV & IV-A: 15 tank assemblies
Size V: 10 tank assemblies

4.3.2 Examination. Each tank assembly selected IAW 4.3.1 shall be examined as specified in TABLE V. Any nonconformance revealed by the examination shall be cause for rejection of the entire lot.

4.3.3 Tests. All production tanks shall be subjected to the air leakage test. The tank assembly selected IAW 4.3.1 shall be tested as specified in TABLE VI. An overload test IAW 4.5.1.6 (Step 1 only, using water up to 100% capacity) shall be required when the randomly selected tank in the lot acceptance/conformance test process fails the air leakage test. The number in the 'Conformance Inspection Sequence' column of TABLE VI specifies the order in which the corresponding test shall be performed. An 'X' indicates the corresponding test can be performed in any order while an 'NR' indicates the corresponding test need not be performed. 'FS' indicates Fabricated Samples as specified in 4.1.1. The actual test to be performed is listed in the 'Test' and 'Test Paragraph' columns. Failure of the overload test or final air leakage test following a successful overload test shall constitute rejection of that tank. Additionally, rejection of the conformance test tank shall require testing of additional tanks and may be cause for rejection of the entire lot at the discretion of the government contracting officer. See FIGURE A5 for a conformance testing flow chart for tank assemblies.

4.3.4 Tank Assembly Fabric. Properties for the fabric used to manufacture production tank assemblies shall be documented IAW TABLE IV and provided to the government in electronic format. A comparison of these properties with the baseline of fabric properties in 4.2.1 should vary no more than the margin of error in the respective ASTM tests. If the variance exceeds that margin of error, an ECP is required.

TABLE IV. Base Fabric Properties Quality Assurance

| Test | ASTM Guidance/Reference Paragraph |
|---|---|
| Weight of fabric | D 3776 |
| Peel adhesion | D 751 |
| Tensile strength | D 751 |
| Tear strength | D 751 |
| Ultimate elongation | D 751 |

| | |
|---|---|
| Coating compound composition | n/a |
| Diffusion rate | 4.5.2.5 |

4.4 Examination Schedule.

TABLE V. Examination Schedule.

| Number | Examination Description | Requirement Paragraph |
|---|---|---|
| 101 | Certification of tank assembly components not as specified. | 3.3, 3.4, 3.5 |
| 102 | Dimensions of the tank not as specified. | 3.4 |
| 103 | Drain fitting assembly not as specified. | 3.4 |
| 104 | Vent fitting assembly not as specified. | 3.4 |
| 105 | Berm liner not as specified. | 3.13 |
| 106 | Repair kit not as specified. | 3.14, 3.15 |
| 107 | Quantity of accessories not as specified. | 3.7 |
| 108 | Drain hose assembly(s) not as specified and/or not completely assembled. | 3.7 |
| 109 | Drain valve assembly(s) not as specified and/or not completely assembled. | 3.4, 3.7 |
| 110 | Filler/discharge hose assembly not as specified and/or not completely assembled. | 3.7 |
| 111 | Filler/discharge valve assembly not as specified and/or not completely assembled. | 3.4, 3.7 |
| 112 | Identification markings not as specified. | 3.8 |
| 113 | Warning labels not as specified. | 3.8 |
| 114 | Valves not labeled as specified. | 3.8 |
| 115 | Color not as specified. | 3.9 |
| 116 | Repair and Rework not as specified. | 3.10 |

4.5 Testing.

4.5.1 Tank Assembly Tests.

4.5.1.1 Air Leakage. Pressurize the tank to a minimum of 0.5 pound per square inch gauge (psig) internal air pressure without restricting volumetric growth. Thirty (30) minutes after initial pressurization, adjust the internal air pressure, as required, to maintain a minimum of 0.5 psig. Conduct the test indoors to control conditions, use a soap and water solution, and examine the entire tank, including all seams and fittings for air leakage. Any evidence of air leakage shall constitute failure of this test.

4.5.1.2 Low Temperature. The tank shall be folded exactly the same way as for placement in the shipping container and then placed, unshielded, in a low temperature environment for a period of 72 hours where the temperature may not be warmer than -25ºF. At the end of this period, the tank shall be completely unfolded within 30 minutes. Any flaking, cracking, delamination, or separation of the coated fabric, shall constitute failure of this test.

4.5.1.3 High Temperature. The tank shall be folded exactly the same way as for placement in the shipping container and then placed, unshielded, in a high temperature environment at a minimum of 160ºF for a period of 48 hours and cooled to a minimum of 100ºF for an additional 24 hours. At the end of the test time, while still at final test temperature, the tank shall be completely unfolded within 30 minutes. Any flaking, cracking, delamination, or separation of the coated fabric shall constitute failure of this test.

4.5.1.4 Tank Assembly Deployment. The tank assembly shall be deployed in a berm in accordance with 3.11. Failure to meet the requirements stated in 3.11 constitutes failure of this test.

4.5.1.5 Fuel Storage. Place the tank outdoors, without environmental protective covering, in a berm lined with a berm liner. Unless otherwise specified, fill the tank to a minimum of 100% of rated capacity (by volume) with JP-8 and allow to stand for a minimum of 30 days. During the test, examine the tank twice daily as well as at the end of the test period for signs of leakage, including wetness. Any examination shall be postponed if weather conditions, such as rain or high humidity, inhibit inspection and will resume under favorable examination conditions. Any evidence of leakage shall constitute failure of this test.

4.5.1.6 Tank Overload. At the end of the 30 day storage test, the first article sample tank shall be subjected to a tank overload test according to the procedures as outlined below. The tank shall be filled with JP-8. The test shall be conducted in a dry location and the tank placed on a non-absorbent berm liner during this test. The tank shall be monitored throughout each step of the test. Immediately after the tank is emptied, the tank bottom and berm liner shall be examined for leakage, i.e., wetness or discoloration of fabric shall constitute failure of this test. All times listed are minimum times.

1) Fill bladder to full capacity +10%; allow to stand for 8 hours
2) Drain bladder to 40% capacity; allow to stand for 1 hour
3) Fill bladder to full capacity +10%; allow to stand for 8 hours
4) Drain bladder to 40% capacity; allow to stand for 1 hour
5) Fill bladder to full capacity +10%; allow to stand for 8 hours
6) Drain completely; fold to original configuration; allow to sit for 48 hours
7) Unfold completely; fill bladder to full capacity +10%; allow to stand for 8 hours
8) Drain bladder to 40% capacity; allow to stand for 1 hour
9) Fill bladder to full capacity +10%; allow to stand for 8 hours
10) Drain completely

4.5.2 Tank Fabric Sample Tests.

4.5.2.1 Fuel Extraction. Fabric samples for conducting the Ozone Resistance (see 4.5.2.2) test and Weather Resistance (see 4.5.2.3) test shall be prepared using the following procedures:

1) Immerse separate samples in each fuel identified in 3.3.3 (except for Automotive Spark-Ignition Engine Fuel) for 7 days at 160ºF
2) Remove the specimens from the fuel, blot with paper towels, and allow to dry in an air circulating hood for at least 24 hours.
3) Place samples in a vacuum oven and dry for 16 ± 2 hours at 120ºF at 20 inches of mercury

4.5.2.2 Ozone Resistance. Ozone resistance after fuel extraction and drying shall be tested as specified in ASTM D 1149, Test Method A. The samples shall be conditioned for 14 days at a temperature of 104 ± 4ºF in air having a partial pressure of ozone of 50 millipascals. Fuel extraction shall be IAW 4.5.2.1. Nonconformance to TABLE I requirements shall constitute failure of the test.

4.5.2.3 Weather Resistance. Weather resistance testing is applicable to all coating compounds intended to be located on the outside of the tank. Accelerated weathering testing shall be IAW ASTM D 750, ASTM G 155, and AATCC 111 using a Xenon light type weatherometer on samples that have been fuel extracted IAW 4.5.2.1. The breaking strength of the material after aging shall be conducted on both warp and fill samples according to ASTM D 751, Procedure B. Failure of any sample set IAW ASTM D 751 shall constitute failure of this test.

4.5.2.4 Gum Content. Cut a 0.2-ounce specimen of each tank material into approximately 0.0625-inch squares, place in a flask containing 8.5 fluid ounces of Reference Fuel D of ASTM D 471, and allow to stand for 48 hours at 73±5°F. A sample of the fuel shall be retained for later use. Decant and filter the contaminated fluid through Whatman 41H filter paper or equal. Determine the existent/unwashed gum content of the filtrate in accordance with ASTM D 381 using the air jet or steam jet vaporizing medium (which is appropriate for the fuel) and an evaporation time of 45 minutes. Using the same samples after completing the existent/unwashed gum content test above, determine the solvent washed gum IAW ASTM D 381. A minimum of three specimens shall be used. The retained fuel sample shall be tested with the same methods. The existent/unwashed gum content from the original fuel sample shall be subtracted from the existent/unwashed gum obtained from the fuel used in the soak test. The solvent washed gum from the original fuel sample shall be subtracted from the solvent washed gum obtained from the fuel used in the soak test. Nonconformance to TABLE I shall constitute failure of the test. This test shall be repeated with all fuels identified in 3.3.3 (except for Diesel Fuel and Automotive Spark-Ignition Engine Fuel).

4.5.2.5 Diffusion. The test apparatus shall consist of a diffusion cup and ring, using FIGURE A4 as a guide. Other cup designs are acceptable as long as the inside diameter of the cup and ring is maintained at 2.00 ± 0.02 inches and the cup is 1.00 ± 0.06 inches deep. Cut a circular test disk of coated fabric to conform to the outside diameter of the cup flange. Punch holes in the disk to correspond to the flange bolt dimensions as needed. The cup shall be filled with approximately 1.4 fluid ounces of JP-8. A suitable solution shall be used to seal the exposed fabric around the outer edge of the test disk and to seal the test disk to the diffusion cup flange. The test disk shall be placed over the cup with the tank "interior" side toward the fuel. The bolts shall be tightened securely. Place the diffusion cup in a suitable rack in a constant temperature of 73.3 ± 2ºF, and a relative humidity of 65 ± 2 percent. Allow 1 hour for the assembly to reach equilibrium, and then weigh the cup to the nearest 0.005 gram and place in the rack face upward. Keep the cup at the above constant temperature and humidity for 24 hours and then weigh and check for vapor loss. Re-torque the bolts if necessary. Invert the cup (test disk down) in a rack that permits free access of air to the test disk. Weigh the cup daily. Defective films or leaks caused by faulty assembly are usually found when the cup is weighed on the third day. Continue to weigh the cup daily

until the weight loss is constant to within 0.010 grams per day after two 24-hour periods. Then record daily weight loss for a continuous interval of 72 hours. The diffusion rate (D) in fluid ounces per square foot per 24 hours shall be the average of not less than three samples when calculated from the following expression:

$$D = \frac{144 \text{ (average daily loss in grams)}}{\text{(Sp. Gr.) } (29.573)(3.142)(R^2)}$$

where Sp. Gr. is the specific gravity of the test medium and R is the inside radius of the test cup. The diffusion test shall be repeated and diffusion rates recorded for all fuels in accordance with 3.3.3 (First Article Test only). Nonconformance to the requirement in TABLE I with JP-8 as the test fluid shall constitute a failure of this test.

4.5.2.6 Puncture Resistance. Puncture resistance testing shall be in accordance with ASTM D 751 (Puncture Resistance, Section 22-25), except the ring clamp mechanism shall have an internal diameter of 3 inches. Nonconformance to TABLE I requirements shall constitute failure of this test.

4.5.2.7 Low Temperature Crease Resistance. Immerse three coated fabric samples, each 8 inches square, in JP-8 fuel conforming to MIL-DTL-83133, and condition for 24 ± 1 hour, at 73 ± 5ºF. Remove samples, place on a wire screen, and air dry with forced air at 73 ± 5ºF for 24 ± 1 hour. Fold the samples in half in each direction so that a folded corner occurs in the center of each sample. Place each folded sample under a 4-pound load and condition at -25 ± 2ºF for 46 hours. At the end of the conditioning period, unfold the samples while still at a temperature of -25ºF and examine visually. Cracking, peeling, or delamination of any coating material shall constitute failure of this test. If samples do not fail, then subject them to the diffusion test specified in 4.5.2.5 except position the sample in the diffusion cup in such a manner that the center of the previous fold coincides with the center of the cup and use only JP-8 as the test fluid. Nonconformance to TABLE I requirements shall constitute failure of the test. This test shall be repeated with all fuels identified in 3.3.3.

4.5.2.8 Blocking. Place three coated fabric samples 6.00 inches by 1.00 inch on a smooth surface in such a manner that the ends are overlapped 1.00 inch. Place a 4-pound weight (± 1 ounce) directly on the overlapped areas. Place prepared samples in an oven. After conditioning at a temperature of 158 ± 2ºF for 4 hours, take the samples from the oven; remove the weight, and condition for 1 hour at 73 ± 5ºF and 65 ± 2 percent humidity. Retain one end of the sample in a suitable clamping device, allowing the other end to hang, and suspend a 4-ounce load from the free end of the samples. Inability of the strips to separate within 5 seconds under the 4-ounce load shall constitute failure of this test.

4.5.2.9 Seam Dead Load Shear Resistance. The test samples shall be 1.00 ± 0.02 inch wide (parallel to the seam) with coated fabric extending a minimum of 3.00 inches (perpendicular to the seam) on each side of the seam for holding and attaching the weight. One index mark shall be scribed on each side of the seam to facilitate observation and measurement of slippage. Each sample shall be subjected to a constant (dead load) tension force equivalent to the 4.0 safety factor ± 0.50 pounds while immersed in JP-8 at 160 ±5ºF for 96 ± 2 hours. The container holding the sample and fuel shall be leak proof and capable of withstanding the JP-8 vapor pressure at the test temperature. After 96 hours examine each sample while under tension for signs of slippage or seam delamination. Three samples shall be tested for each determination. Slippage or delamination, by any sample, greater than specified in TABLE II shall constitute failure of this test.

4.5.2.10 Breaking Strength and Breaking Strength Retention - Material. Material breaking strength retention is defined as the ratio of the breaking strength of the conditioned fabric to the breaking strength of the unconditioned fabric.

1) Original Material Breaking Strength – Determine breaking strength as received by using three 1 inch x 6 inch coated fabric specimens as received and the breaking strength performed according to ASTM D 751, Procedure B (Cut Strip Test Method) and reported in lb/in. Cut samples in the warp (machine direction) and the fill (cross) directions and test and report separately.
2) Breaking strength after JP-8 Extraction and Accelerated Weathering – Immerse coated fabric panels 5 inch x 6.5 inch in JP-8 fuel of MIL-T-83133 for at least 7 days at 160°F. Remove the specimen from the fuel, blot with paper towels, and allow to dry in an air circulation hood for at least 24 hours. Place the specimen in a vacuum oven at 120ºF for 16 ± 2 hours at a vacuum above 20 inches of mercury. Expose the dried panels (exterior surface facing the light source) in the weatherometer in accordance with ASTM D 750 with alternate Corex D Filters removed for 1500 hours. Nonconformance to TABLE I requirements shall constitute failure of the test.

4.5.2.11 Breaking Strength and Breaking Strength Retention - Seam. Seam breaking strength retention is defined as the ratio of the breaking strength of the conditioned seamed fabric to the breaking strength of the unconditioned seamed fabric.

1) Original Seam Breaking Strength– Three seam breaking strength specimens 1.00 inches wide (parallel to the seam) and extending (perpendicular to the seam) 3.00 inches beyond both edges of the seam are used and tested at room temperature in accordance with ASTM D 751. Express reported values in lb/in. Failure within the seam on any specimen constitutes failure of the test.
2) Breaking strength after JP-8 Extraction and Accelerated Weathering – Immerse seamed coated fabric panels 5 inch x 6.5 inch in JP-8 fuel of MIL-T-83133 for at least 7 days at 160ºF. Remove the specimen from the fuel, blot with paper towels, and allow to dry in an air circulation hood for at least 24 hours. Place the specimen in a vacuum oven at 120ºF for 16 ± 2 hours at a vacuum above 20 inches of mercury. Expose the dried seamed panels (exterior surface facing the light source) in the weatherometer in accordance with ASTM D 750 with alternate Corex D Filters removed for 1500 hours. Nonconformance to TABLE II requirements shall constitute failure of the test.

4.5.2.12 Peel Adhesion – Seams After Fuel Extraction. Peel adhesion after JP-8 Extraction and Accelerated Weathering – Immerse seamed coated fabric panels 5 inch x 6.5 inch in JP-8 fuel of MIL-T-83133 for at least 7 days at 160ºF. Remove the specimen from the fuel, blot with paper towels, and allow to dry in an air circulation hood for at least 24 hours. Place the specimen in a vacuum oven at 120ºF for 16 ± 2 hours at a vacuum above 20 inches of mercury. The dried panels are then exposed (exterior surface facing the light source) in the weatherometer in accordance with ASTM D 750 with alternate Corex D Filters removed for 1500 hours. Nonconformance to TABLE II requirements shall constitute failure of the test.

4.5.2.13 Peel Adhesion – Seams After Fuel Extraction and Water Immersion. Three specimens of seam at least 1 inch wide by at least 6 inches long shall be submitted to the following fuel extraction, water immersion and peel adhesion procedures:

1) Immerse the specimens in JP-8 conforming to MIL-DTL-83133 for at least 7 days at 160ºF.
2) Remove the specimens from the fuel, blot with paper towels, and allow to dry in an air circulating hood for at least 24 hours.

3) Place the specimens in a vacuum oven at 120° F for 16 ± 2 hours at a vacuum above 20 inches of mercury.
4) Immerse the dried specimens in distilled or deionized water for 28 days at 180°F.
5) At the end of the 28 day immersion period, remove the specimens and condition in fresh distilled or deionized water at room temperature for at least one hour prior to testing.
6) Peel adhesion of the specimens shall be in accordance with ASTM D 413, Machine Method.

NOTE: Nonconformance to TABLE II requirements shall constitute failure of the test.

4.5.3 Test Schedule.

TABLE VI. Test Schedule

| First Article Sequence | Conformance Inspection Sequence | Test | Test Paragraph | Requirement Paragraph |
|---|---|---|---|---|
| 1 | 1 (All production tanks) | Air leakage | 4.5.1.1 | 3.5 |
| 2 | NR | Low temperature | 4.5.1.2 | 3.5 |
| 3 | NR | High temperature | 4.5.1.3 | 3.5 |
| 4 | NR | Deployment | 4.5.1.4 | 3.11 |
| 5 | NR | Fuel storage | 4.5.1.5 | 3.5 |
| 6 | (See Note) | Tank overload | 4.5.1.6 | 3.5 |
| X (FS) | NR | Ozone resistance | 4.5.2.2 | 3.3.4 & TABLE I |
| X (FS) | NR | Weather resistance | 4.5.2.3 | 3.3.4 & TABLE II |
| X (FS) | NR | Solvent washed gum | 4.5.2.4 | 3.3.4 & TABLE I |
| X (FS) | X (FS) | Diffusion rate | 4.5.2.5 | 3.3.4 & TABLE I |
| X (FS) | X (FS) | Puncture resistance | 4.5.2.6 | 3.3.4 & TABLE I |
| X (FS) | NR | Low temperature crease resistance | 4.5.2.7 | 3.3.4 & TABLE I |
| X (FS) | X (FS) | Blocking | 4.5.2.8 | 3.3.4 & TABLE I |
| X (FS) | X (FS) | Seam dead load shear resistance | 4.5.2.9 | 3.3.4 & TABLE II |
| X (FS) | NR | Breaking strength retention | 4.5.2.10 (material) 4.5.2.11 (seam) | 3.3.4 & TABLES I and II |
| X (FS) | X (FS) | Peel adhesion | 4.5.2.12 & 4.5.2.13 | 3.3.4 & TABLE II |

NOTE: Overload test using 4.5.1.6 (Step 1 only, using water up to 100% capacity) shall be required when

the randomly selected tank in the lot acceptance/conformance test process fails the air leakage test.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended Use. The tank is intended for use as a storage container for kerosene-based and naphtha-based fuels in accordance with 3.3.3. The tank is military unique and is expected to interface with existing fuel distribution systems and perform as specified in extreme operating terrain and climates. The rigors of the battlefield require a fuel distribution system having capabilities exceeding those of commercially available items in areas of safety, durability, and range of performance. The collapsible tanks will be used with current DOD tactical fuel systems in an expeditionary environment.

6.2 Acquisition Requirements. Acquisition documents will specify the following:

1) Title, number, and date of this specification
2) Issue of DoD Single Stock Point for Military Specifications, Standards, and Related Publications (DODSSP) to be cited in solicitation and, if required, the specific issue of individual documents referenced (see 2.2 and 2.3)
3) When a first article inspection is required, the number and size of units required, and the time frame for submission (see 1.2, 3.2, 3.4, 4.2, and 6.3)
4) When accessories are not required (see 3.7)
5) When a berm liner is not required (see 3.13)
6) When emergency field repair kits are not required (see 3.14)
7) When tank chests are required (see 3.17)
8) When special marking or labeling is required (see 3.8)
9) Packaging requirements (see 5.1)

6.3 First Article. When a first article inspection is required, the item(s) should be a preproduction model for each size tank. The Contracting Officer will include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results, and disposition of the first articles.

6.4 Definitions. The following definitions apply for this specification.

6.4.1 Blister. A blister is a flaw on the surface caused by non-adherence or by separation of an applied substance.

6.4.2 Holiday. A holiday is a place not covered by coating compound.

6.4.3 Tunnel. A tunnel is a passage way through a seam.

6.4.4 Unadhered Pocket. An unadhered pocket is a section of the seam where the material is not properly bonded.

6.5 Subject term (key word) listing.

Collapsible fuel tank
Fuel storage bladder
Tank assembly

APPENDIX A

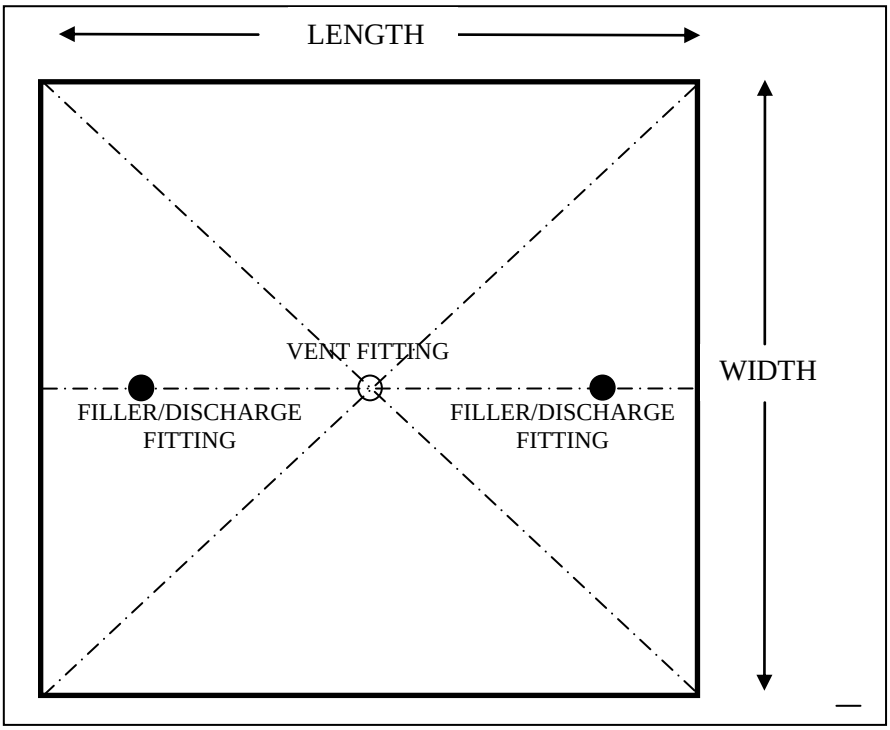


FIGURE A1. Size I, II, and III Tanks.

NOTES:

1. Length and Width dimensions as specified in 3.4.4.
2. Location of filler/discharge and vent fittings shall be as shown ± 3 feet.
3. Location of Filler/Discharge fittings shall permit hose removal without spillage.
4. For size II and III tanks, a drain fitting, for the water draining capability, shall be located within 3 feet of the point directly under each filler discharge fitting.

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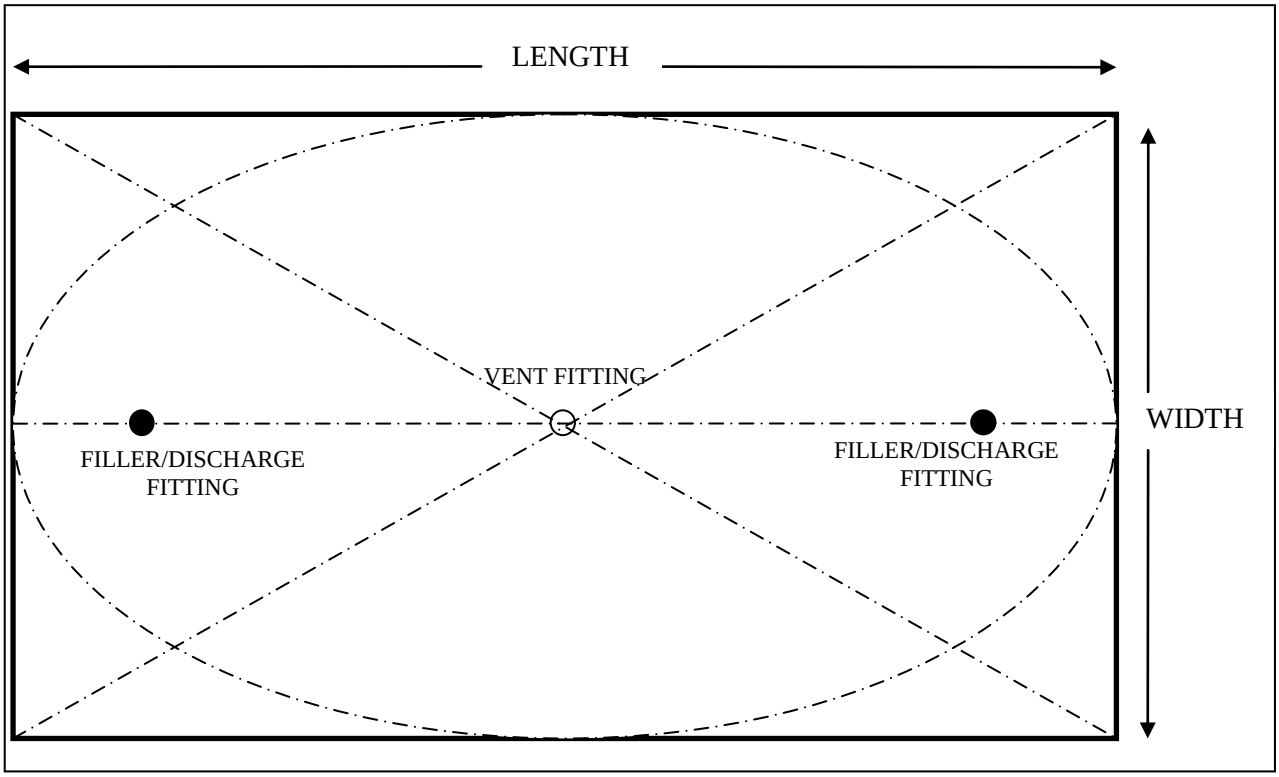


FIGURE A2. Size IV and IV-A Tanks.

NOTES:

1. Length and Width dimensions as specified in 3.4.4.
2. Location of Filler/Discharge fittings shall be located towards the middle of the width of the tank.
3. Vent fitting shall be placed at the center of the tank.
4. Location of Filler/Discharge fittings shall permit hose removal without spillage.
5. A drain fitting, for the water draining capability, shall be located within 3 feet of the point directly below each filler/discharge fitting.

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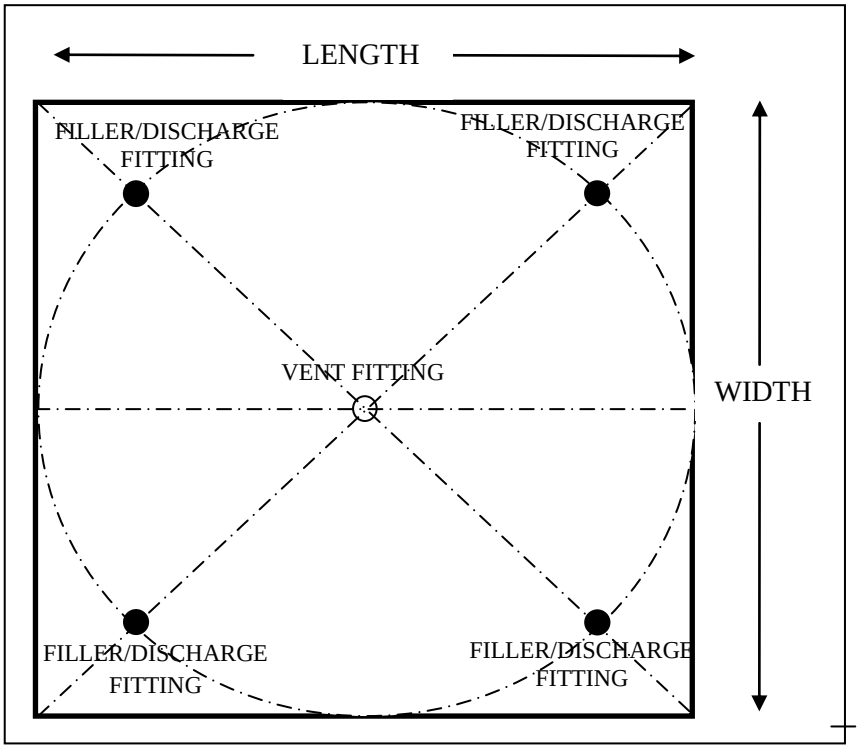


FIGURE A3. Size V Tanks.

NOTES:

1. Length and width dimensions as specified in 3.4.4.
2. Location of filler/discharge and vent fittings shall be as shown ± 3 feet.
3. Location of filler/discharge fittings shall permit hose removal without spillage.
4. A drain fitting, for the water draining capability, shall be located within 3 feet of the point directly below each filler/discharge fitting.

APPENDIX A

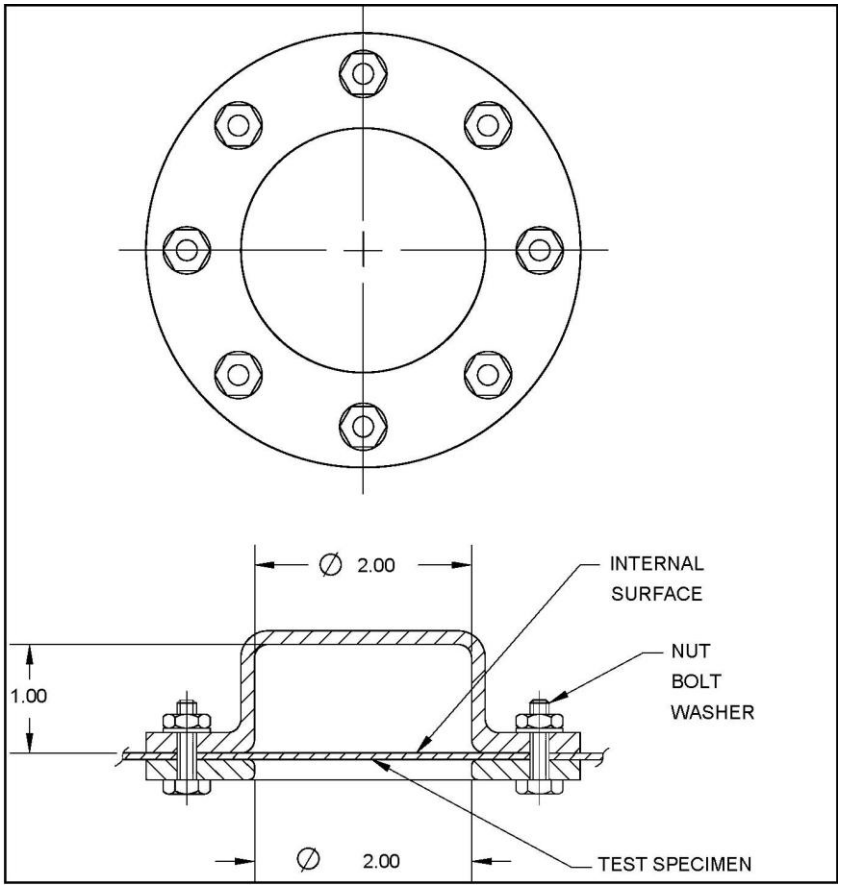


FIGURE A4. Diffusion Cup Assembly.

NOTE: Dimensions are in inches as specified in 4.5.2.5.

# APPENDIX A

## CONFORMANCE TESTING FLOW CHART for TANK ASSEMBLIES

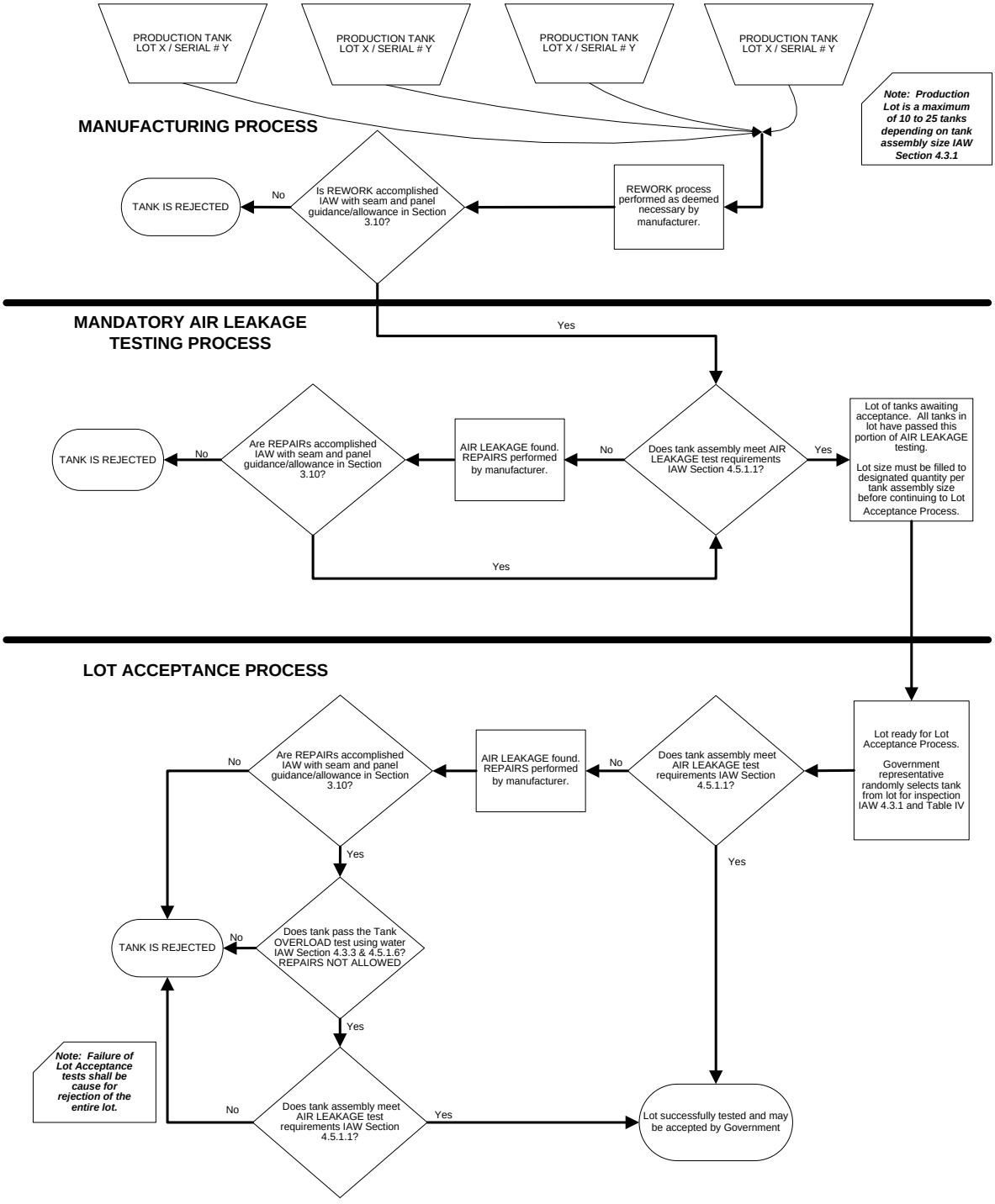


FIGURE A5: Conformance Test Flow Chart for Tank Assemblies.

Custodians:
Army-AT
Navy-MC
Air Force-84

Preparing activity:
Army - AT
(Project 3835-2012-001)

Reviewing Activity:
Air Force-68
DLA-PS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil/online/start/.