INCH-POUND

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SUPERSEDING
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MILITARY SPECIFICATION

DRUMS, FABRIC, COLLAPSIBLE, LIQUID FUEL, CYLINDRICAL, 500-GALLON CAPACITY

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

1. SCOPE

1.1 Scope. This specification covers three types of nonvented cylindrical, 500-gallon capacity, collapsible rubber drums, for storing and transporting fuels.

1.2 Classification. The drum shall be the following types as specified (see 6.2).

Type I	- 78 inches long, with both internally mounted fuel/defuel valve and with 2 inch x 2 inch coupler valve and adapter.
Type II	- 58 inches long, with one, 2 inch x 1-1/2 inch coupler valve and adapter.
Type III	- 58 inches long with two, 2 inch x 1-1/2 inch coupler valves and adapters.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards 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: USA Belvoir Research, Development, and Engineering Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 8110

SPECIFICATIONS

FEDERAL

A-A-881	- Bags, Shipping, Burlap.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-640	- Boxes, Fiberboard, Corrugated, Triple-Wall.
PPP-C-795	- Cushioning Material, Packaging (Flexible Closed Cell Plastic for Long Shipping Cycle Applications).
PPP-P-291	- Paperboard, Wrapping and Cushioning.
PPP-T-60	- Tape: Packaging, Waterproof.

MILITARY

MIL-P-116	- Preservation, Methods of.
MIL-N-5877	- Nozzle, Pressure Fuel Servicing, Locking, Type D-1 and D-2, Nominal 2-1/2 Inch Diameter.
MIL-T-6396	- Tank, Aircraft Propulsion Fluid System, Internal, Removable, Non-Self-Sealing.
MIL-L-10547	- Liner, Case, and Sheet, Overwrap, Water Vaporproof or Waterproof, Flexible.
MIL-Y-40628	- Yoke, Towing and Lifting, for Drums, Fabric, Collapsible.
MIL-G-46015	- Gasoline, Automotive, Combat, Referee Grade.

STANDARDS

MILITARY

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	- Marking for Shipment and Storage.
MS24484	- Adapter, Pressure Fuel Servicing, Nominal 2.5 Inch Diameter.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Government drawings. The following Government drawings form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

TA13216E9170	- Drum, Fabric, Collapsible, Liquid Fuel, 500 Gallon Capacity, Type II, (Shortie).
TA13217E2990	- Drum, Fabric, Collapsible, Liquid Fuel, 500 Gallon Capacity, Type I, (Longie).
TA13227E6314	- Drum, Fabric, Collapsible Liquid Fuel, 500 Gallon Capacity, Type III (Shortie).

(Copies of drawings required by contractors in connection with specific acquisition functions should be obtained from the USA Belvoir Research, Development, and Engineering Center, ATTN: STRBE-FSH, Fort Belvoir, VA 22060-5606.)

2.2 Non-Government publications. The following document(s) 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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 381 - Existent Gum in Fuels by Jet Evaporation.
D 471 - Rubber Property - Effect of Liquids.
D 751 - Coated Fabric.
D 814 - Rubber Property - Vapor Transmission of Volatile Liquids.
D 2000 - Rubber Products in Automotive Applications.
E 8 - Tension Testing of Metallic Materials.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION (NMFTA)

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Association, ATTN: Traffic Order Section, 2200 Mill Road, Alexandria, VA 22314.)

UNIFORM FREIGHT CLASSIFICATION COMMITTEE (UFCC)

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, ATTN: Tariff Publishing Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(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.)

2.3 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 Description. The type I, type II and type III drums shall be as shown on Top Assemblies TA13216E9170, TA13217E2990, and TA13227E6314 and as specified herein.

3.1.1 Drawings. The drawings forming a part of this specification are end product drawings. No deviation from the prescribed dimensions or tolerances is permissible without prior approval of the contracting officer. Where tolerances could cumulatively result in incorrect fits, the contractor shall provide tolerances within those prescribed on the drawings to insure correct fit, assembly, and operation of the drum. Any data (e.g. shop drawings, layouts, flow sheets, processing procedures, etc.) prepared by the contractor or obtained from a vendor to support fabrication and manufacture of the production item shall be made available, upon request, for inspection by the contracting officer or designated representative.

3.2 First article. Unless otherwise specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Materials. Materials shall be as specified herein and as shown on the drawings. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Inner liner rubber compound. The inner liner rubber compound shall conform to ASTM D 2000, composition M5BG610A14EF21. The maximum volume swell requirement under EF21 shall be 35 percent.

3.3.2 Outer cover rubber compound. The outer cover rubber compound shall conform to ASTM D 2000, composition M5BC610A14C12EF21. The maximum volume swell requirement under EF21 shall be 40 percent when tested in accordance with table 4 of ASTM D 2000.

3.3.3 Cord or fabric rubber compound. The cord or fabric rubber compound shall conform to ASTM D 2000, composition M5BG610A14EF21. The maximum volume swell requirement under EF21 shall be 40 percent.

3.3.4 Recovered metals. For the purpose of this requirement, recovered metals are those metals which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The metal components, pieces and parts incorporated in the drum may be newly fabricated from recovered metals to the maximum extent practicable, provided the drum produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the drum.

3.4 Construction. Figure 1 indicates the general configuration of the type II drum (see 6.6).

3.4.1 Body, drum. The drum shall be cord or fabric reinforced rubber construction, with an inner liner of material as specified in 3.3.1 and an outer cover of material as specified in 3.3.2. The cord or fabric reinforced center layer shall be impregnated with rubber compound as specified in 3.3.3.

3.4.2 Fuel/defuel valve. Each type I drum shall be equipped with a fuel/ defuel valve as shown in drawing D13216E9194 (part of TA13217E2990) which shall permit filling and emptying of the drum by means of a D-1 nozzle conforming to MIL-N-5877. The fuel/defuel valve shall be capable of performing the fuel/ defuel cycle to either shut off flow to the drum upon reaching an internal pressure of 4.5 ±0.5 pounds per square inch gage (psig) above local atmospheric pressure, or

to open upon the application of a negative pressure at the adapter inlet. The valve shall be fitted with a pressure fuel servicing adapter conforming to the high strength type of MS24484. The fuel/defuel valve shall neither extend externally more than 1.125 inches beyond the bearing plate nor extend internally more than 3.250 inches beyond the inside face of the closure plate shown in TA13217E2990. All surfaces of the valve that shall contact the drum wall shall be smooth and rounded with no sharp edges or radii smaller than 0.5 inch. The weight of the valve shall be not more than 5.25 pounds. The fuel/defuel valve shall be provided with a dust cap to fit over the adapter opening. The dust cap shall be tethered to the fuel/defuel valve by means of a cable, chain, or other suitable means.

3.4.3 Sleeve and wire rope assembly. The sleeve and wire rope assembly shall have a breaking strength of not less than 12,000 pounds.

3.5 Physical characteristics.

3.5.1 Permeability of fluid. The permeability rate of reference fuel B through the drum wall shall be not more than 0.10 fluid ounce per square foot per 24 hours (fl oz/sq ft/24 hrs) when tested in accordance with 4.5.2.1.1.

3.5.2 Unwashed gum. The existent (unwashed) gum content shall be no more than 60 mg/100 mL when tested in accordance with 4.5.2.1.2.

3.5.3 Existent gum. The heptane-washed existent gum content shall be no more than 5 mg/100 mL when tested in accordance with 4.5.2.1.3.

3.5.4 Puncture resistance. The drum wall (excluding the reinforced ends) shall withstand a force of not less than 325 pounds without being punctured when tested in accordance with 4.5.2.1.4.

3.5.5 Adhesion. The adhesion between the cover and cord plies, between cord plies, and between the liner and cord plies shall be 10 lbs./in. (minimum) when tested in accordance with 4.5.2.1.5. The adhesion after immersion in fuel between the liner and cord plies and between cord plies shall be 5 lbs./in. (minimum) when tested in accordance with 4.5.2.1.5.

3.5.6 Expansion dimensions. Drum dimensional changes shall be not more than the following, when subjected to a pressure of 30 pounds per square inch gage (psig) for 7 hours, when tested in accordance with 4.5.2.2.1.

a. Overall length - 1 inch.
b. Diameter - 6 inches.

3.5.7 Weight. The weight of the completely assembled drum when tested in accordance with 4.5.2.2.2 shall be not more than the following:

Type I - 315 pounds maximum.
Type II - 275 pounds maximum.
Type III - 300 pounds maximum.

3.6 Performance.

3.6.1 Hydraulic pressure test. The drum shall withstand a hydraulic pressure test of 45 psig, without any visual evidence of leakage, loss of pressure, external or internal component layer separation, delamination, or blistering when tested in accordance with 4.5.2.2.3.

3.6.2 Proof pressure. Each drum shall withstand the proof pressure of 30 psig without any visual evidence of leaking, layer separation, delamination, cracks, or splits when tested in accordance with 4.5.2.2.4.

3.6.3 Fuel storage. The drum shall withstand the 72 hour fuel storage test without any visual evidence of leakage, inner liner separation, cracks, splits, or deterioration when tested in accordance with 4.5.2.2.5.1.

3.6.4 Airdrop. The drum shall withstand six successive airdrops from a height of not less than 12.7 feet without any visual evidence of leakage, broken cables or hardware, or separation of component layers of the drum body when tested in accordance with 4.5.2.2.5.2.

3.6.5 Towing, ground. The drum shall be capable of being towed as a wheel for 10 miles over paved road without any visual evidence of leakage when tested in accordance with 4.5.2.2.6.

3.6.6 Low temperature collapsibility. The drum shall be collapsible and capable of being emptied at -30 ±2 °F, with not more than 20 gallons of gasoline remaining in the emptied drum. The drum shall show no visual evidence of leakage, blistering, delamination, splits, or cracks, chipping, or sloughing when tested in accordance with 4.5.2.2.7.

3.6.7 Ambient temperature collapsibility. The drum shall be filled and emptied through 75 cycles, without any visual evidence of leakage, external or internal blistering, delamination, splits, cracks, or chipping when tested in accordance with 4.5.2.2.8.

3.6.8 Leakage. The drum shall withstand the leakage test specified in 4.5.2.2.9 without any visual evidence of leakage.

3.7 Body, drum. After complete fabrication and prior to assembly of the drum, the inside and outside shall be cleaned of all foreign material. The color of the outer surface shall be black.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. 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 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.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications, standards, and drawings, as applicable.

4.1.3 Parts and components. Parts and components detailed on the drawings shall be inspected in accordance with the quality assurance provisions (QAP) shown on the drawings. The drawings specify the characteristics requiring QAP inspection, the sampling plan, and the basis for acceptance and rejection (see 6.7 and 6.8).

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).
c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Examination. The first article drums shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 Tests. The first article drums and material samples shall be subjected to tests marked "X" in column 1 of table I. Every test specified in 4.5.2.2, except 4.5.2.2.4 and 4.5.2.2.9, shall be conducted on one of three drums so that approximately one-third of the tests shall be performed on each drum. Type I drums shall be tested in accordance with 4.5.2.2.10. Tests specified in 4.5.2.2.4 and 4.5.2.2.9 shall be conducted on each of three drums. All tests specified in 4.5.2.1 shall be performed on the material samples. The material samples shall be representative of materials used to fabricate the drum body. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Lot. A lot shall consist of not more than 300 drums or one month's production of the same type, each drum having successfully passed the tests specified in 4.4.4.1.

4.4.2 Sampling for examination and tests.

4.4.2.1 Drums. Three drums shall be selected at random from each lot for tests. A lot shall be accepted when zero defects are found and rejected when one or more defects are found.

4.4.2.2 Drum body material. One sample of drum body material approximately 2-foot square and of the approximate thickness of the drum body shall be prepared from the rubber compounds and cord or fabric used in fabricating the drums of the lot. The drum body material sample shall be cured equivalent to the drums.

4.4.3 Examination. All three drums selected (see 4.4.2.1) shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.4.4 Tests.

4.4.4.1 Individual. Each drum shall be subjected to the tests marked "X" in column 2 of table I. Failure of any test shall be cause for rejection of the drum.

4.4.4.2 Samples.

4.4.4.2.1 Drums. Drums selected in accordance with 4.4.2 shall be subjected to tests marked "X" in column 3 of table I as follows: One of the drums, regardless of the type, shall be tested as specified in 4.5.2.2.2 and 4.5.2.2.3. In addition to the above tests, the type I drum shall be tested as specified in 4.5.2.2.10. The remaining two drums, regardless of type, shall be tested as specified in 4.5.2.2.5 and 4.5.2.2.1. Failure of any test shall be cause for rejection of the represented lot of drums.

4.4.4.2.2. Drum material samples. Samples selected in accordance with 4.4.2 shall be tested as specified in 4.5.2.1.1 through 4.5.2.1.5. Failure of any test shall be cause for rejection of the represented drums.

4.5 Inspection procedure.

4.5.1 Examination. The drum shall be examined as specified herein for the following defects:

101. Any part (or component) not in accordance with the QAP requirements as shown on the drawings (see 3.1).
102. Components fractured, split, sprung, malformed, or missing (see 3.1).
103. Material not as specified (see 3.3).
104. Inner liner rubber compound not as specified (see 3.3.1).
105. Outer cover rubber compound not as specified (see 3.3.2).
106. Cord or fabric rubber compound not as specified (see 3.3.3).
107. Used, rebuilt or remanufactured components, pieces and parts incorporated in the drum (see 3.3.4).
108. Drum body not as specified (see 3.4.1).
109. Fittings not as specified (see 3.4.2).
110. Finish of fittings not as specified (see 3.4.2).
111. Fittings not located as specified (see 3.4.2).
112. Inside and outside of drum not cleaned of all foreign material (see 3.7).
113. Color not as specified (see 3.7).

4.5.2 Tests.

TABLE I. Test schedule.

First Article	Quality Conformance		Test	Test Paragraph	Requirement Paragraph
	Indiv.	Sample			
1	2	3	4	5	6
X	-	X	Permeability.	4.5.2.1.1	3.5.1
X	-	X	Unwashed gum.	4.5.2.1.2	3.5.2
X	-	X	Existent gum.	4.5.2.1.3	3.5.3
X	-	X	Puncture resistance.	4.5.2.1.4	3.5.4
X	-	X	Adhesion.	4.5.2.1.5	3.5.5
X	-	X	Expansion.	54.5.2.2.1	3.5.6
X	-	X	Weight.	4.5.2.2.2	3.5.7
X	-	X	Hydraulic pressure.	4.5.2.2.3	3.6.1
X	X	-	Proof pressure.	4.5.2.2.4	3.6.2
X	-	X	Fuel storage.	4.5.2.2.5.1	3.6.3
X	-	X	Airdrop.	4.5.2.2.5.2	3.6.4
X	-	-	Rolling tow.	4.5.2.2.6	3.6.5
X	-	-	Low temperature collapsibility.	4.5.2.2.7	3.6.6
X	-	-	Ambient temperature collapsibility.	4.5.2.2.8	3.6.7
X	X	-	Leakage assembly.	4.5.2.2.9	3.6.8
X	-	X	Fuel/defuel valve.	4.5.2.2.10	3.4.2
X	-	X	Sleeve and wire rope assembly.	4.5.2.2.11	3.4.3

4.5.2.1 Drum material sample. The drum material sample shall be tested as follows:

4.5.2.1.1 Permeability test. The permeability test shall be conducted in accordance with ASTM D 814, except that the sample shall be identical in construction and material to the total cross section of the drum and of the thickness of the drum wall. This test may be performed using an aluminum cup with a suitable clamping device in lieu of the permeability jar specified in ASTM D 814. The test liquid shall be ASTM D 471, reference fuel B. If aluminum cups are used, a nylon solution (Elvamide 8061) can be used to seal the edges. The average of three determinations shall be reported. Nonconformance to 3.5.1 shall constitute failure of this test.

4.5.2.1.2 Unwashed gum. Cut a 5 gram specimen from the drum interior coating compound into 0.0625 inch squares and place in a flask containing 250 mL of ASTM D 471 reference fuel B and allow to stand for 48 hours at 73 ±3 °F. Decant and filter the contaminated fluid through Whatmen 41H filter paper, or equal. Determine the unwashed gum in accordance with section 10 of ASTM D 381 using the air jet vaporizing medium and an evaporation time of 45 minutes. The average of three determinations shall be reported. Nonconformance to 3.5.2 shall constitute failure of this test.

4.5.2.1.3 Existent gum. Samples from 4.5.2.1.2 may be used to determine the heptane-washed existent gum in accordance with section 10 of ASTM D 381. The average of three determinations shall be reported. Nonconformance to 3.5.3 shall constitute failure of this test.

4.5.2.1.4 Puncture resistance test. The drum wall (excluding the reinforced ends) shall be puncture tested as specified in MIL-T-6396, except that the force required shall be 325 pounds. Nonconformance to 3.5.4 shall constitute failure of this test.

4.5.2.1.5 Adhesion test. One set of drum material samples shall be tested in accordance with ASTM D 751 for a minimum adhesion of 10 lbs/in. between the cover and cord plies, between the cord plies, and between the liner and cord plies. A second set of drum material samples shall be immersed in ASTM reference fuel B at 73 ° F for 70 hours. After immersion the samples shall be tested in accordance with ASTM D 751 for a minimum adhesion of 5 lbs/in. between the liner and cord plies and between cord plies. Nonconformance to 3.5.5 shall constitute failure of this test.

4.5.2.2 Drums.

4.5.2.2.1 Expansion test. The drum shall be filled with water to a pressure of 30 psig. The length and diameter shall be measured within 15 minutes. The length shall be measured by placing a 90 degree square upright at each end and measuring the distance between squares. The diameter shall be similarly measured by placing the square upright against each side at the center of the drum and measuring the distance between squares. These measurements shall be the original dimensions. The drum shall be maintained at 30 psig for 7 hours; at the end of the 7 hours the measurements of length and diameter shall be repeated as described above. The difference between these final measurements and the original measurements shall be regarded as the changes in dimensions. Nonconformance to 3.5.6 shall constitute failure of this test.

4.5.2.2.2 Weight test. The emptied drum with hardware shall be weighed. Nonconformance to 3.5.7 shall constitute failure of this test.

4.5.2.2.3 Hydraulic pressure test. The drum shall be filled with water and subjected to pressure of 45 psig for 30 minutes to determine compliance with 3.6.1. The test pressure must be applied continuously and evenly, and must be constant throughout the test period. After performance of the hydraulic pressure test, the drum shall be emptied and visually examined, both externally and internally. Nonconformance to 3.6.1 shall constitute failure of this test.

4.5.2.2.4 Proof pressure test. Each drum shall be subjected to a hydrostatic pressure of 30 psig and allowed to stand for 30 minutes. At the end of 5 minutes,

the pressure shall be readjusted to 30 psig if the pressure has dropped due to expansion of the drum. Nonconformance to 3.6.2 shall constitute failure of this test.

4.5.2.2.5 Fuel storage and airdrop tests.

4.5.2.2.5.1 Fuel storage test. The drum shall be filled with a minimum of 450 gallons of gasoline conforming to MIL-G-46015, type I and allowed to stand for a period of 72 hours at ambient temperature (40 - 90 °F). At the end of each 24 hour period the drum shall be rotated 180 degrees and then examined for leakage. After completion of the 72 hour period the drum shall be emptied and the hardware shall be removed for visual examination of the inner liner. Nonconformance to 3.6.3 shall constitute failure of this test. The gasoline will be analyzed for existent and unwashed gum levels both before and after the storage and the results reported.

4.5.2.2.5.2 Airdrop test. After completion of the fuel storage test, the drum shall be reassembled and refilled with a minimum of 450 gallons of fluid having a specific gravity of between 0.72 and 1.00. The drum shall then be lifted by the two anchor shackles on the fill end until the opposite end has a minimum ground clearance of 12.7 feet. The drum shall then free fall onto unprepared ground such as grass, sand, or bare earth. The soil shall not contain excessive water to form a viscous liquid. This drop procedure shall be repeated until a total of three consecutive drops are recorded. The drum shall then be lifted within its cylindrical side parallel to the ground to a height of not less than 12.7 feet. This height shall be measured from the lowest point on the bottom of the drum to the ground. The drum shall then free fall onto unprepared ground such as grass, sand, or bare earth. The soil shall not contain excessive water to form a viscous liquid. This drop procedure shall be repeated until a total of three consecutive drops are recorded. After completing the six airdrops, the drum shall be visually examined for leaks; then emptied and visually examined, internally and externally, for evidence of broken hardware and separation of component layers of the drum body. Nonconformance to 3.6.4 shall constitute failure of these tests.

4.5.2.2.6 Rolling tow test. The drum shall be filled with a minimum of 350 gallons of water. A tow bar conforming to MIL-Y-40628 shall be attached to the lugs, and the drum shall be towed as a wheel for not less than 10 miles over a paved road. The rate of speed of towing shall be between 5 to 10 miles per hour (mph). Nonconformance to 3.6.5 shall constitute failure of this test.

4.5.2.2.7 Low temperature collapsibility test. The emptied drum shall be cooled to -30 ±2 °F and filled with a measured 460 gallons of gasoline conforming to MIL-G-46015, type I which has been cooled to -30 ±2 °F. The drum shall be cold soaked for 24 hours at -30 ±2 °F. The drum shall then be emptied of not less than 440 gallons of gasoline using a suitable pump and subjected to a minimum vacuum of 12 inches of mercury (Hg). This test shall be conducted at -30 ±2 °F with the drum in a horizontal position. Nonconformance to 3.6.6 shall constitute failure of this test.

4.5.2.2.8 Ambient temperature collapsibility test. The empty drum shall be filled with 460 gallons of gasoline conforming to MIL-G-46015, type I. The drum shall then be emptied of not less than 435 gallons of gasoline using a suitable pump and the drum subjected to a minimum vacuum of 12 inches Hg. This test shall be conducted at ambient temperature with the drum in a horizontal position. The

drum shall be filled and emptied 75 times. The drum hardware shall be disassembled for examination of the drum internal carcass. Nonconformance to 3.6.7 shall constitute failure of this test.

4.5.2.2.9 Leakage test. Each drum shall be inflated with air to 6 ±0.5 psig, and sprayed with soap or detergent sudsing solution over the entire surface to determine compliance with 3.6.8. Leakage shall be determined by observing areas for bubbling of sudsing solution.

4.5.2.2.10 Fuel/defuel valve test (type I drum). This test shall be performed by installing the fuel/defuel valve in a representative drum. The drum shall be filled to capacity at a flow rate of 200 gallons per minute (gpm) minimum and line pressure of 55 to 60 psig at the nozzle inlet with a D-1 nozzle. Upon completion of filling, the pressure within the drum shall be observed to determine compliance with 3.4.2. The drum shall then be defueled by means of the D-1 nozzle to determine proper opening of the valve. Nonconformance to 3.4.2 shall constitute failure of this test.

4.5.2.2.11 Sleeve and wire rope assembly test. The sleeve and wire rope assembly shall be tested in accordance with ASTM E 8. Nonconformance to 3.4.3 shall constitute failure of this test.

4.6 Inspection of packaging.

4.6.1 Quality conformance inspection of pack.

4.6.1.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.6.1.2 Sampling. Sample size shall be determined by using MIL-STD-105, table I and table IIa. A lot shall be accepted when zero defects are found and rejected when one or more defects are found.

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. Presence of one or more defects shall be cause for rejection.

114.	Drum not thoroughly drained and dried as specified for level A (see 5.1.1.1).
115.	Shackles not wrapped and wrap not secured as specified for level A (see 5.1.1.1).
116.	Drum not collapsed and folded as specified for level A (see 5.1.1.1).
117.	Technical manual not preserved as specified (see 5.1.1.2).
118.	Coupler valves not wrapped and wrap secured as specified for level A (see 5.1.1.2).
119.	Coupler valve and technical manual not placed in the bag specified and the bag not secured as specified for level A (see 5.1.1.2).
120.	Drum and required components not preserved in a manner to afford protection against deterioration and damage during shipment for level C (see 5.1.2).
121.	Shipping container not as specified for level A and B (see 5.2.1 and 5.2.2).
122.	Box closure and strapping not as specified for level A and B (see 5.2.1 and 5.2.2).
123.	Drum and required components not individually packed to assure carrier acceptance and safe delivery for level C (see 5.2.3).

124. Marking missing, illegible, incorrect, or incomplete for level A, B, or commercial (see 5.3).

5. PACKAGING

5.1 Preservation. Preservation shall be level A or C, as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Drum. Each drum shall be thoroughly drained and the interior and exterior shall be dried prior to packaging. Each shackle shall be wrapped with corrugated, single faced paperboard material conforming to PPP-P-291, type I, style 1, which shall be secured with tape conforming to PPP-T-60, type IV. Each drum shall be collapsed and compactly folded so that one swivel plate is on the interior of the bundle and the other is on the top exterior of the bundle.

5.1.1.2 Components. The technical manual shall be preserved in accordance with MIL-P-116, method IC-1 or IC-3. The coupler valve shall be wrapped with cushioning material conforming to PPP-C-795, class I, having a thickness classified as thick. Cushioning material shall be secured with tape conforming to PPP-T-60, type IV. The technical manual and the cushioned coupler valve shall be placed in a bag conforming to A-A-881, size as appropriate. The bag shall be secured with tie cord or wire to a lug on the exposed end swivel plate of the drum.

5.1.2 Level C. Each drum complete with required components shall be preserved in a manner to afford protection against deterioration and damage during shipment from the contractor to the initial destination.

5.2 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

5.2.1 Level A. Each drum, preserved as specified in 5.1, shall be individually packed in a close-fitting box conforming to PPP-B-621, class 2, style 2 or 2-1/2, type 3 load. Each box shall be equipped with a caseliner conforming to MIL-L-10547, type IV, grades E or F. When skids and reinforcement battens are required, the battens shall be placed on the box exterior and the skids shall be placed on the outside of the box bottom, in alignment with each side reinforcement batten. Box assembly, closure and strapping shall be as specified in the appendix to the box specification except that the strapping shall be flat, the finish B and that a dado shall be incorporated into the bottom face of each skid, full length at the center line, so that strapping, normally positioned adjacent to the skids, shall completely encompass the reinforcement battens and the skids. Alternatively, when specified (see 6.2), the shipping container may be a close-fitting box conforming to PPP-B-601, overseas type, style A or B, with caseliner as specified herein and with the box lid secured to the box body with formed spring clips/fasteners and strapping in lieu of nailing and strapping.

5.2.2 Level B. Each drum, preserved as specified in 5.1, shall be packed as specified in 5.2.1 for level A except that boxes shall be domestic type, or each complete drum, preserved as specified in 5.1, shall be packed in a close-fitting box conforming to PPP-B-640, class 2, style A, B, C, or D.

5.2.3 Level C. Each drum, complete with required components, shall be individually packed to assure carrier acceptance and safe delivery to destination

at lowest ratings in compliance with Uniform Freight Classification Rules or National Motor Freight Classification Rules.

5.3 Marking. In addition to any special marking specified in the contract or purchase order (see 6.2), marking shall be in accordance with MIL-STD-129.

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 500 gallon collapsible drums are intended for the following:

a. Storage of liquid fuel.
b. Transporting liquid fuel by:
   (1) Truck.
   (2) Aircraft.
   (3) Helicopter.
   (4) Airdrop from fixed wing aircraft.
   (5) Towing as a wheel.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Type of drum required (see 1.2).
c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
d. Time frame required for submission of first article and number of drums required (see 3.2).
e. When the Government will conduct any or all of the preproduction model examination and tests. When the Government will conduct some but not all of the first article examination and tests, the contracting officer should specify which examination and tests will be conducted by the Government and which examination and tests shall be conducted by the contractor (see 3.2).
f. Level of preservation and packing required (see 5.1 and 5.2).
g. When alternate PPP-B-601, style A or B box with special closure is required for level A (see 5.2.1).
h. Any special marking required (see 5.3).

6.3 First article. When a first article inspection is required, the items should be a preproduction model. The first article should consist of three units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results and disposition of the first articles. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.4 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

6.5 Provisioning. The contracting officer should include provisioning requirements for repair parts and maintenance tools as necessary (including any special tools), and instructions regarding shipment of drums.

6.6 Information figure. Figure 1 shows a type II drum which has been found acceptable; however, the figure is included for illustration only and is not intended to preclude the furnishing of another type II drum which conforms to this specification.

6.7 Quality assurance provisions (QAP). The contracting officer should require the contractor to maintain records of all QAP inspections. A suggested paragraph is as follows:

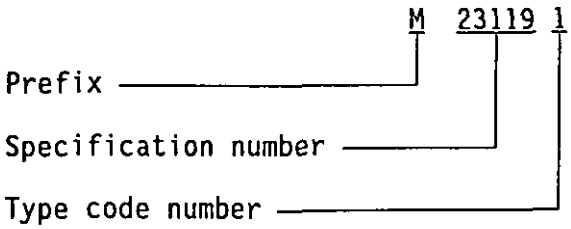
> "The contractor shall maintain complete records of all examinations and tests performed to verify the requirements of classified QAP characteristics. The records shall include, as a minimum, lot size, sample size, drawing requirements, actual measurements, number and type of deficiencies found, quantity approved, quantity rejected, and corrective action taken when applicable."

6.8 Definition.

6.8.1 Quality assurance provisions (QAP). A QAP is a contractual requirement that supplements section 4 of the specification. QAP's indicate the minimum requirements which must be inspected on the product drawings to verify the design objectives of the product and assure interchangeability of repair parts.

6.9 Classification change. Type I, class 1 and class 2 have been deleted as no longer required.

6.10 Part or identifying number (PIN). The PIN to be used for drums acquired to this specification are created as follows:



Example for type I, type II, and type III (respectively):

M23119-1
M23119-2
M23119-3

6.11 Subject term (key word) listing.

Blivet
Fuel drum
Rubber drum

6.12 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - ME
Navy - SA
Air Force - 69

Review activities:
Army - AT
Air Force - 99
DLA - GS

User activity:
Navy - MC

Preparing activity:
Army - ME

Project 8110-0299

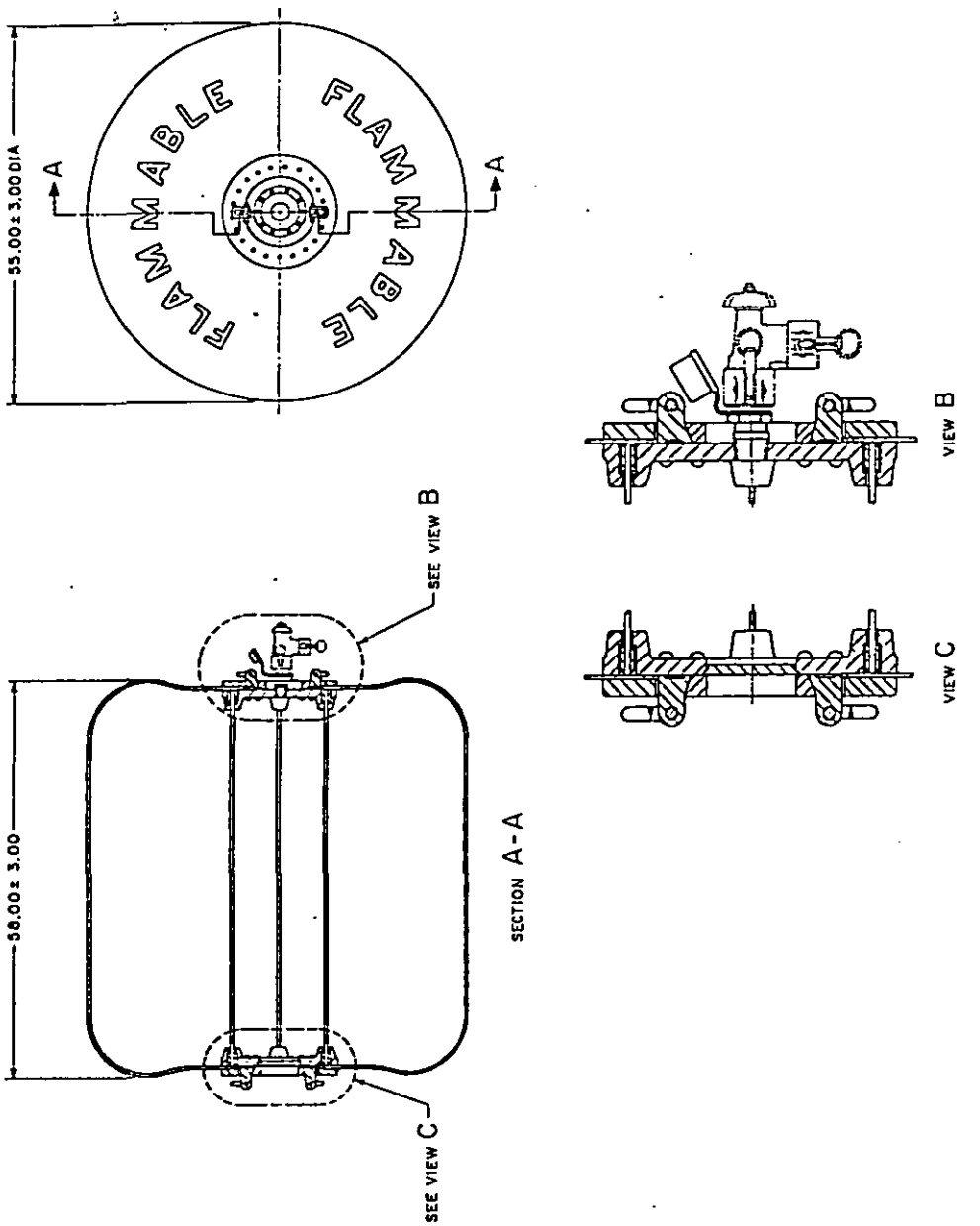


FIGURE 1. Drum, fabric, collapsible, liquid fuel, cylindrical, 500 gallon capacity, Type II (shorlie).

X-1361

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.

RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-D-23119G	2. DOCUMENT DATE (YYMMDD) 920715

3. DOCUMENT TITLE Drums, Fabric, Collapsible, Liquid Fuel, Cylindrical, 500-Gallon Capacity

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 (if applicable) (2) AUTOVON	7. DATE SUBMITTED

8. PREPARING ACTIVITY

a. NAME Betty Taylor	b. TELEPHONE (Include Area Code) (1) Commercial (703) 704-3466	(2) AUTOVON 654-3466
c. ADDRESS (Include Zip Code US Army Belvoir RDE Center ATTN: STRBE-TSE Fort Belvoir, VA 22060-5606	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	