

MIL-D-6055C
 31 Dec 1970
SUPERSEDING
 MIL-D-6055B
 19 April 1962

MILITARY SPECIFICATION

DRUMS, METAL, REUSABLE SHIPPING AND STORAGE (CAP. FROM 88 to 510 CUBIC INCHES)

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

1. SCOPE

1.1 Scope. This specification covers the requirements for new reusable cylindrical drums consisting of body, cover, gasket, and closing device(s) to be used as interior and exterior shipping containers.

1.2 Classification. Drums, metal, shipping, and storage, shall be of the following types, classes, and sizes as specified (see 6.2).

Type I	-	Formed Drum - Recessed or Dome Style
Type II	-	Drawn Drum - Recessed or Dome Style
Class A	-	Aluminum Alloy Drum
Class S	-	Steel, Drum
Size No. 1	-	88 Cubic Inch Capacity
Size No. 2	-	167 Cubic Inch Capacity
Size No. 3	-	149 Cubic Inch Capacity
Size No. 4	-	224 Cubic Inch Capacity
Size No. 5	-	282 Cubic Inch Capacity
Size No. 6	-	340 Cubic Inch Capacity
Size No. 7	-	425 Cubic Inch Capacity
Size No. 8	-	510 Cubic Inch Capacity

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Federal

QQ-S-698	-	Steel, Sheet, and Strip, Low-Carbon
QQ-T-191	-	Terne Sheets (Long and Short Ternes)
TT-C-490	-	Cleaning Methods and Pretreatment of Ferrous Surfaces for Organic Coatings
TT-E-485	-	Enamel; Semi-Gloss, Rust-Inhibiting
PPP-B-636	-	Box, Fiberboard
PPP-C-1120	-	Cushioning Material, Uncompressed Bound Fiber for Packaging

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Military

- MIL-P-6808 - Primer Coating, Zinc Chromate, For Aircraft and Missile Applications; Application of
- MIL-S-6855 - Synthetic Rubber Sheet, Strips, Molded or Extruded Shapes
- MIL-A-8625 - Anodic Coatings, For Aluminum and Aluminum Alloys
- MIL-I-26860 - Indicator, Humidity, Plug, Color Change

STANDARDS

Federal

- Fed Test Method Std. No. 101 - Preservation, Packaging, and Packing Materials: Test Procedures
- Fed-Std No. 595 - Colors

Military

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-130 - Identification Marking of U. S. Military Property
- MIL-STD-147 - Palletized and Containerized Unit Loads, 40" by 48" Pallets, Skids, Runners, or Pallet-Type Base
- MS24347 - Drums, Metal, Reusable Shipping and Storage

(Copies of specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

UNIFORM CLASSIFICATION COMMITTEE

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, 202 Union Station, 516 W. Jackson Blvd., Chicago, Illinois 60606.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC.

National Motor Freight Classification

(Application for copies should be addressed to American Trucking Association, ATTN: Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

3. REQUIREMENTS

3.1 First article. This specification provides for first article examination and testing (see 4.4).

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3.2 Materials. Materials used in the manufacture of drums, if not specifically described herein, shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended.

3.2.1 Class A drums. Drums and covers shall be constructed of a suitable aluminum to satisfy the test, surface finish, and service requirements of this specification. The closing device shall be fabricated or coated with a metallic material compatible with respect to its position in the galvanic series, as the aluminum used in the drum and cover.

3.2.2 Class S drums. Drums and covers shall be constructed of steel conforming to the requirements of QQ-S-698. Strips for lugs and locking rings shall be cold-rolled strip, quarter-hard No. 3 temper, edge condition No. 4 round edge rolled and free from burrs and sharp edges. An alternate material of temper plated steel conforming to type II of QQ-T-191 is authorized for drums and covers. The closing device shall be fabricated from material which will exclude any galvanic corrosion between components of the drum and shall be free from burrs and sharp edges.

3.2.3 Gaskets. Gaskets shall be formed from synthetic rubber conforming to MIL-S-6855, class II, grade 60. After forming, the gaskets shall lie naturally with the flat surface parallel to the horizontal plane.

3.3 Design and construction. The drum and components shall be constructed in accordance with MS24347, except that metal thicknesses shown in the drawing shall be interpreted as specified minima. The dimensions of each drum design and effective thicknesses of its components shall be such that the drum meets all the requirements of the specification.

3.3.1 Cover. The drum cover may be either recessed or dome style. Unless otherwise specified by the procuring activity, the recessed drum cover will be furnished in accordance with MS24347 (see 6.2).

3.3.2 Closure. The drum shall be provided with a closing device consisting of a circumferential locking ring held in place by means of a bolt. The lugs shall be constructed of material of sufficient thickness so that the bolt will not distort the lugs when the ring is subjected to the required torque (see 4.5.1). Other types of closing devices may be used provided they are specifically approved by the procuring agency and meet the test requirements of this specification. The closure bolt and nut shall be in accordance with MS24347.

3.3.3 Locking ring seal. The locking ring bolt or lug(s) shall be so constructed that a wire and lead tamperproof seal may be affixed after closure in such a manner that the cover cannot be removed without destroying the seal. The drum manufacturer is not required to furnish the wire and lead seal.

3.3.4 Relative humidity indicator plug. When specified by the procuring activity, the drum body shall be provided with a humidity indicator plug conforming to MIL-I-26860, type II (see 6.2). The provision shall allow for a hermetic seal between the drum body and the indicator plug.

3.4 Finish.

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3.4.1 Class A drums. The closing device, if made of steel, shall be finished as specified in 3.4.2 for class S drums. Aluminum alloy components of the class A drums shall be anodized on all surfaces in accordance with MIL-A-8625. All exterior aluminum surfaces of the drums shall then be coated with not less than one coat of zinc chromate primer conforming to MIL-P-6808 and one coat, 1/2 mil thick, of enamel conforming to TT-E-485, color No. 24087, Fed Std No. 595.

3.4.2 Class S drums (also steel closing devices of class A drums). All interior and exterior surfaces shall be prepared for painting in accordance with type I or II of TT-C-490. All interior and exterior surfaces shall then be coated with not less than one coat of zinc chromate primer conforming to MIL-P-6808 and one coat, 1/2 mil thick, of enamel conforming to TT-E-485, color No. 24087, Fed Std No. 595. When terne plated steel is used, all interior and exterior surfaces of the drum, cover, and closing device shall be thoroughly cleaned and dried and shall be coated with not less than one coat of zinc chromate primer conforming to MIL-P-6808 and one coat, 1/2 mil thick of enamel conforming to TT-E-485, color No. 24087 of Fed Std No. 595.

3.4.3 Flexibility. The protective coatings of all class drums shall not crack when tested in accordance with 4.5.5.

3.5 Performance.

3.5.1 Drum leakage. Drums shall show no leaks when tested in accordance with first article and quality conformance testing as defined by paragraphs 4.4 and 4.6.

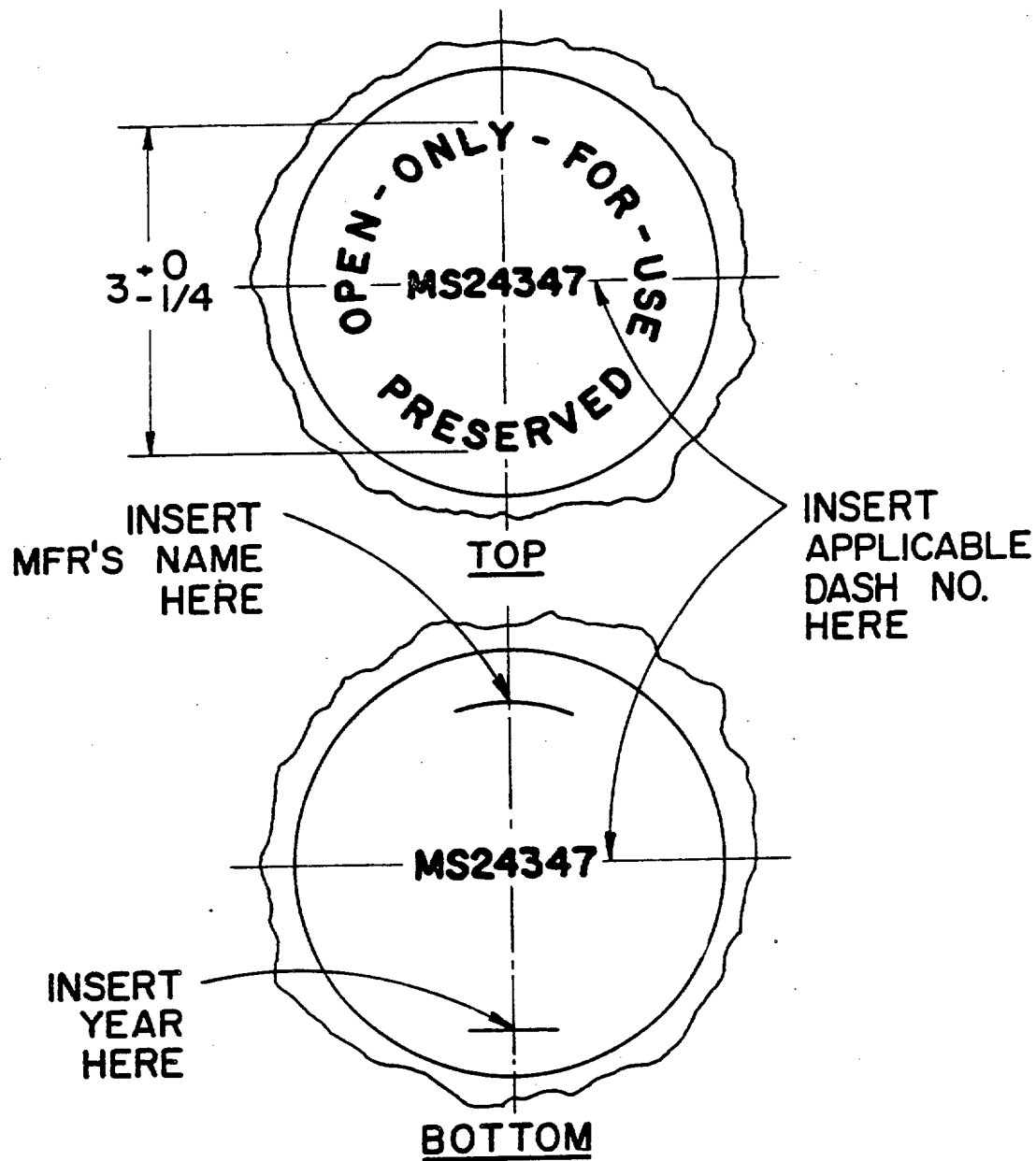
3.5.2 Cover fit. After removing and replacing the cover on the loaded drum, which was subjected to the "Rough Handling Test" (para 4.5.3) and "Cover Fit" (para 4.5.4), the drum shall show no sign of leakage.

3.6 Marking. The drum bodies shall be marked in accordance with MIL-STD-130 and shall be marked, stamped, stenciled, or painted with waterproof ink or paint in 3/8 inch letters as follows:

REUSABLE DRUM
DO NOT DESTROY

When the drum is assembled, the marking shall appear approximately three quarters of an inch below the lower edge of the locking ring. The color of the ink or paint shall conform to color No. 23538 of Fed Std No. 595. The cover and the bottom of the drum shall be embossed in accordance with figure 1.

3.7 Workmanship. Workmanship shall be of such quality that the finished drum shall have no sharp burrs or rough surfaces. The metal and forming of metal shall be free of defects which may affect the durability, strength, or serviceability of the drum. The drum, including all components, shall be manufactured in such a manner that when tested in accordance with tests specified herein, there shall be no dents or deformation of the lower portion of the drum exceeding 1/2 inch in depth; no separation of the bottom or side seams of formed drums; or dents in the top, bottom, or sides of the drawn or formed drums. Paint shall be applied in a uniform manner and shall be of specified thickness.



DRUM-COVER AND BOTTOM MARKING

FIGURE - I

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirement 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 assure supplies and services conform to prescribed requirements.

4.2 Sampling. For the purpose of sampling, all drums of the same size and type offered for delivery at one time shall be considered a lot for purposes of sampling and inspection.

4.3 Classification of inspection. The inspection and testing of drums shall be classified as follows:

- a. First article examination and test (see 4.4).
- b. Quality conformance examination and tests (see 4.6).

4.4 First article examination and test. First article inspection shall be mandatory for all new contractors. The first article tests shall consist of all the conformance tests herein and the following additional tests in 4.5.1, 4.5.2, 4.5.3, 4.5.4, and 4.5.5.

4.4.1 Test drums. First article tests shall be conducted using five finished drums of each size to be produced. One drum shall be subjected to the hydraulic pressure test described in 4.5.1. Each of the four remaining drums shall be subjected to the air leak test in 4.5.2, the rough handling test in 4.5.3, and the cover fit test in 4.5.4.

4.4.2 Test specimens. Two specimen test panels shall be prepared and tested for flexibility as specified in 4.5.5.

4.4.3 Exceptions to first article. First article inspection may be waived on reprourement contracts where the supplier has shown capability to manufacture the item(s) on previous contracts. The supplier must furnish a certified statement to the effect that he has not changed materials or manufacturing processes to the procuring activity. The first article test requirements may be invoked at any time by the procuring activity against the supplier when deficiency data reveals/indicates that items received are not requisite quality.

4.5 Test methods.

4.5.1 Hydraulic Pressure test. This test shall be performed in accordance with method 5009 of Fed Test Method Std No. 101 and using the Hydraulic Pressure Technique, except that for the specimen, the intended or simulated contents shall be omitted. The cover of ring closure drums shall be sealed on the drum by applying a torque of 4 plus or minus 1/2 foot pounds to the closure bolt,

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tapping the locking ring repeatedly during application of the above torque. Where use is made of a device which encircles the locking ring and applies pressure uniformly about the circumference of the ring, the closure shall be effected by tightening of the bolt and nut after uniform pressure is applied at all points about the ring. Evidence of non-compliance with 3.5 shall be cause for rejection.

4.5.2 Air leak test. Each of the 4 drums to be tested shall have an air connection installed, and for the testing described in paragraph 4.5.3, shall be loaded with a dummy load, braced and cushioned in such a manner as to prevent damage to the drum by shifting of the dummy load. The net weight of the load, including bracing and cushioning material, shall be as listed in table I. The dummy test load shall be constructed in accordance with 4.5.6. After loading, the drum shall be closed as specified in 4.5.1. Air shall then be forced into the drum until the gate pressure is 4 psi. Without reducing the pressure, the drum shall be tested in water in such a manner that the area being tested is covered by one inch or more of water. The drum shall then be observed for leaks as evidenced by the presence of air bubbles. Evidence of air bubbles caused by leaking air will be cause for rejection (see 3.5.1).

TABLE I. Load

Size No.	Net load--bracing and cushioning included (pounds)
1	5
2	8
3	8
4	8
5	8
6	8
7	8
8	8

4.5.3 Rough handling test. The drums which were subjected to the loaded drum air leak test shall be vertically quartered by marking with a chalk or crayon. Each drum shall then be dropped 8 times in a free fall manner from 30 inches so that it strikes a concrete or steel floor where the quartering lines coincide with the circumference of the top and bottom so that, upon impact, the center of gravity of the container is directly above the point of impact. After each of the 8 drops, the drum shall be allowed to come to rest of its own volition. After the final fall, the drum shall be checked for leaks in accordance with 4.5.2.

4.5.4 Cover fit. After the tests specified in 4.5.3 have been completed, the drums shall be opened, reclosed, and retested in accordance with 4.5.2 to determine compliance with 3.5.2.

4.5.5 Flexibility of coating. Two test specimens shall be prepared from the same material as used for the production drum bodies. The test panels shall be 3 plus or minus 1/4 inch in width by 5 plus or minus 1/4 inch in length. The panels shall be cleaned and dried and the protective coating applied as specified in 3.4.1, 3.4.2 and cured. If curing is accomplished by heat, the panels

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shall be cooled to the test temperature of 80 plus or minus 10 degrees Fahrenheit (°F). The cured panels shall be placed over a 1/4 inch mandrel, held firmly by suitable supports at a point equally distant from the top and bottom edges of the panel, and rapidly (about 1 second) bent double. The panels shall be maintained at 80 plus or minus 10°F during the bending operation. A 7-power lens shall be used to examine the outer surface of the bent panels for evidence of cracking of the protective coating. If any cracks are detected, three additional panels shall be tested as above. If these panels also show cracks in the coating, the enamel shall be discarded and a new batch selected for testing.

4.5.6 Test load. The test load shall consist of wooden disks--metal disks, or a combination of each, having the net weight as specified in table I including bracing and cushioning material. The load shall be rigidly assembled and evenly positioned in the test container. The test load shall be of a size that will permit the use of cushioning material conforming to PPP-C-1120, type IV, to adequately support the load.

4.5.7 Test drums. Drums used in the performance of the first article tests shall not be offered to the Government unless reworked to bring to a new condition and inspected in accordance with 4.6.2.

4.5.8 Rejection and retest. Drums which have been rejected may be reworked and submitted or replaced for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the originals shall be furnished the inspector in writing. Leaks and other defects to be repaired shall be by methods used in construction of containers, not by soldering.

4.6 Quality conformance.

4.6.1 Sampling for inspection. A random sample of drums shall be selected from each lot offered to the Government in accordance with MIL-STD-105 at inspection level S-4. The acceptance quality (AQL) shall be 1.5 percent defective. When MIL-STD-105 specifies an action by the Government, it shall at the option of the Government be performed either by the Government or by the contractor under supervision of the Government inspectors. Samples selected shall be subjected to the visual and dimensional inspection described in 4.6.2.

4.6.2 Visual and dimensional examination. Each of the sample drums selected in accordance with 4.6.1 shall be visually and dimensionally inspected to verify compliance with the requirements of this specification and MS24347. Any drum in the sample containing one or more dimensional and requirements defect, shall be considered a defective unit. Defective units in excess of AQL as specified in 4.6.1 shall be cause for lot rejection.

4.6.3 Leakage test. Each of the sample drums selected in accordance with 4.6.1 shall be tested by the manufacturer at 4 pounds air pressure with seams under water and shall be found free of leakage in compliance with 3.5.

4.6.4 Inspection. Inspection may be made throughout the entire process of manufacture. The passing as satisfactory for any detail of drum, cover, or gasket construction, shall not relieve the contractor of responsibility for faulty workmanship or faulty materials which may be discovered at any time prior to acceptance.

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4.7 Inspection of preparation for delivery. An inspection shall be made to determine that packing and marking as required in section 5 of this specification are complied with. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully prepared for delivery except that interior attributes may be examined on the container before closure. The lot size shall be the number of containers in the inspection lot. The inspection level shall be S-2 and the acceptable quality level shall be 4.0 defects per hundred units.

<u>Attributes</u>	<u>Defects</u>
Markings	Incorrect, illegible; of improper size location, sequence, or method of application.
Materials	Any nonconforming component, component missing, damaged, or otherwise defective, affecting serviceability.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, bulging or distortion of containers, etc.
Weight or content	Number per container is less than specified, gross weight exceeds specifications.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging is not required for the drum body. Preservation is not required for the cover, gasket, or locking ring but level C packaging is required.

5.1.1 Level C. The covers, gasket, and locking ring shall be placed individually in a paper envelope or sack and accompany the drum during shipment within the same shipping container.

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

5.2.1 Level A. Drums of the same size shall be packed in fiberboard boxes conforming to style RSC, type CF or SF, class Weather Resistant of PPP-B-636. The grade of boxes used shall conform to the dimensional and gross weight requirements of PPP-B-636 but shall not be lower than grade W5 in any event. For Army shipments, the grade of box shall be V2S conforming to PPP-B-636. The number of drums per exterior box shall be:

<u>Size number of drums</u>	<u>Drums per exterior box</u>
1 and 3	24
2	18
4	24
5 through 8	12

5.2.2 Level B. Drums of the same size shall be packed in fiberboard shipping containers conforming to style RSC, type CF or SF, class Domestic of PPP-B-636. The grade of fiberboard used in the boxes shall conform to the dimensional and gross weight requirements of PPP-B-636 but shall not be lower than grade 275 in any event. The number of drums per box shall be as specified for level A.

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When specified (see 6.2), the shipping containers shall be V3C, V3S, or V4S fabricated in accordance with PPP-B-636.

5.2.3 Level C. Drums shall be packed in a manner which will insure arrival at destination in satisfactory condition and which will be acceptable to the carrier at lowest rates. Containers shall be in accordance with Uniform Freight Classification Rules or National Motor Freight Classification Rules as applicable.

5.2.4 Palletization. When specified (see 6.2), boxes packed as specified shall be palletized in accordance with MIL-STD-147.

5.3 Marking. In addition to any special marking required by the contract or order, the shipping containers shall be marked in accordance with the requirements of MIL-STD-129.

6. NOTES

6.1 Intended use. The metal drums covered by this specification are intended to be used for storage and shipment of military material.

6.2 Ordering data. Procurement document should specify the following:

- a. Title, number, and date of this specification.
- b. Quantity.
- c. Type, class, and size to be furnished (see 1.2).
- d. Cover style (see 3.3.1).
- e. Provision for indicator plug type (see 3.3.4).
- f. Level of packing (see 5.2).
- g. When palletization is required (see 5.2.4).

6.3 Instructions for first article. The first article examination and tests shall be conducted under the supervision of the designated procuring agency at the suppliers' plant or at a laboratory, the selection of which shall be mutually agreeable to the supplier and designated procuring activity. If a Government representative is not available to supervise the examination and tests, the supplier is responsible to prepare or have prepared test reports of the first article examinations and tests and forward them to the procuring activity for approval.

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Custodian:

Army - GL
Navy - SA
Air Force - 69

Reviewer:

Army - WC, AT, SM
Navy - AS
Air Force - 70, 71

User:

Navy - AS, SH, YD, EC, MC, MS
Air Force - 84

Preparing Activity:

Air Force - 69

Project No. 8110-0174

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 22-R255
<p>INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p>		
<p>SPECIFICATION MIL-D-6055C; Drums, Metal, Reusable Shipping and Storage</p>		
<p>ORGANIZATION</p>		
<p>CITY AND STATE</p>		<p>CONTRACT NUMBER</p>
<p>MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT</p>		
<p>1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING.</p>		
<p>B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES</p>		
<p>2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID</p>		
<p>3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?)</p>		
<p>4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)</p>		
<p>SUBMITTED BY (Printed or typed name and activity - Optional)</p>		<p>DATE</p>

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

AFLC-WPAFB-NOV 69 3M