PPP-D-729E
April 22, 1977
SUPERSEDING
Fed. Spec. PPP-D-729D
September 15, 1972 and
Fed. Spec. PPP-D-700C
November 10, 1970

FEDERAL SPECIFICATION

DRUMS, SHIPPING AND STORAGE, STEEL, 55-GALLON (208 LITERS)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for new 55-gallon (208 liters) drums (see 6.1).

1.2 Classification.

1.2.1 Types. The drums covered by this specification shall be of the following types and class, as specified (see 6.2).

Type I - DOT 5B

Class A Closedhead straight side, with two rolling hoops rolled or expanded in the cylindrical drum body; double seamed chimes, with chime reinforcements.

Class B - Openhead straight side, with three rolling hoops rolled or expanded in the cylindrical drum body; double seamed bottom chime with chime reinforcement, full removable cover, provided with removable bolted type locking ring.

Type II - DOT 17E - Straight side, with two rolling hoops rolled or expanded in the cylindrical drum body; double seamed chimes, without chime reinforcements.

Type IV - DOT 17H - Straight side, with three rolling hoops rolled or expanded in the cylindrical drum body; bottom chime, without chime reinforcement, full removable cover, provided with removable bolted type locking ring.

FSC 8110

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Type V - DOT 5A - Straight side, unlined steel for acid and corrosive liquids.

Type VI - DOT 5C - Straight side, corrosion-resistant steel for acid and corrosive liquids.

Type VII - DOT 5D - Closehead straight side, lined steel for acid and corrosive liquids.

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:

Federal Specifications:

TT-E-485	-	Enamel, Semigloss, Rust-Inhibiting.
VV-L-800	-	Lubricating Oil, General Purpose, Preservative, (Water Displacing, Low Temperature).
PPP-P-420	-	Plugs and Flanges (For Drum Closures).

Federal Standards:

FED-STD-101	-	Preservatives, Packaging and Packing Materials: Test Procedures.
FED-STD-123	-	Marking for Shipment (Civil Agencies).
FED-STD-141	-	Paint, Varnish, Lacquer, and Related Materials: Methods of Inspection, Sampling and Testing.
FED-STD-595	-	Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

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Military Specification:

MIL-G-432 - Gaskets-Nonmetal, Synthetic Rubber.

Military Standards.

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.

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

CODE OF FEDERAL REGULATIONS, TITLE 49

Transportation Part 178, Shipping Container Specifications
Subpart D, Specifications for Metal Barrels, Drums, Kegs, Cases, Trunks and Boxes

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for the issuance thereof.)

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

Uniform Classification Committee, Agent

Uniform Freight Classification

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

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 1616 P Street, N.W., Washington, DC 20036.)

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3. REQUIREMENTS

3.1 Standard product. The drums shall be new and be the manufacturer's current commercial product except for any changes necessary to comply with the requirements of this specification and the requirements of the applicable DOT specifications.

3.2 Certification. Prior to the first shipment, the supplier shall submit satisfactory evidence to the contracting officer or his authorized representative that the drums meet the applicable Department of Transportation (DOT) specifications. The gaskets, interior coatings, and nonhardening seaming compound shall be compatible with the product being packed (see 6.1 and 6.2). Acceptable evidence of meeting these requirements for gaskets, interior coatings, and nonhardening seaming compound shall be a certified report.

3.3 Materials.

3.3.1 Steel. The sheet or strip steel and the gage shall conform to the applicable Department of Transportation (DOT) requirements as listed in the Code of Federal Regulations, Title 49, Transportation Part 178, Shipping Container Specifications.

3.3.1.1 Descaling of hot-rolled steel. Hot-rolled sheet or strip steel, when used, shall have a minimum of 99 percent of the surface descaled when tested as specified in 4.4.1. In the event occasional appearance of scale exceeds 1 percent, the contractor shall adjust his descaling process so as t meet the requirements of 3.6.1.

3.3.2 Seaming compound. The seaming compound used in the double seams on top drum heads (except removable heads) and bottom drum heads shall be a commercially approved nonhardening type. The seaming compound used shall not affect or be affected by the product being packed. When the product being packaged requires a special seaming compound, the compound should be specified on the order (see 6.2).

3.4 Physical characteristics. The drums shall be new and conform to the requirements of the applicable Department of Transporation, Uniform Freight Classification or National Motor Freight Classification Rules and Regulations and as hereinafter specified. The type I, class A drum body shall have two rolling hoops rolled or expanded in the drum body. The type I, class B drum body shall have three rolled or expanded hoops with centerline of top hoop not more than three inches from top curl. The type II drum body shall be constructed of 20 gage, 0.0359 inch (0.912 mm) sheet steel, when specified (see 6.2). The head of the type IV drum may be constructed of 16 gage, 0.0598 inch nominal (1.519 mm) sheet steel provided there are one or more corrugations near the periphery of the cover.

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3.4.1 Design and construction of types V, VI, and VII drums. Design and construction shall be that approved by DOT for the applicable type drum. Type V shall conform to all of the details of the applicable requirements of DOT 5A. Type VI shall conform to all of the details of the applicable requirements of DOT 5C. Type VII shall conform to all of the details of the applicable requirements of DOT 5D. Double seams that are not welded shall be compound lined prior to closure of the seams. Chime reinforcements on all drums shall be made from minimum 12 gage 0.1046 inches (2.657 mm) nominal steel specified in the applicable DOT specification. Welds shall have strength equal to that of the materials joined, and the welding rod used shall have corrosion resistant qualities equal to, or better than the basic material being welded. When specified (see 6.2), each drum shall have a vent located near the chime in the same head and diametrically opposite the closure. Welds shall not separate; seams or joints shall not fail; the chime reinforcement, foot rings, or hoops shall not loosen; and there shall be no evidence of leakage, when tested in accordance with the applicable DOT specification (see 4.4.4).

3.4.2 Dimensions. The dimensions of types I, (class A), II, and IV drums shall be in accordance with the dimensions shown of figures 1, 2 and 4, as applicable. The heads shall have sufficient depth to allow 1/8 inch (3.2 mm) minimum clearance between the top of the chime and top of closure fittings with the plugs, gaskets, and cap seals in place. This requirement does not apply to the center fitting of drums fitted with an agitator.

3.4.3 Capacity. Rated capacity shall be 55 gallons (208 L). Actual capacity for types I, II and III, including the convex heads, shall be not less than 57.20 gallons (216.5 L) nor greater than 57.75 gallons (218.6 L), when tested as specified in 4.4.2. For the types V, VI and VII, actual capacity shall be not less than 56.1 gallons min and not more than 56.6 gallons max.

3.4.4 Strength. The drums shall not leak when subjected to hydrostatic pressure as indicated in table I and tested as specified in 4.4.3.

TABLE I. Internal hydrostatic and air pressures minimum

Drum type	Air pressures psi 1/	Hydrostatic pressures psi 1/	Time in minutes
I, class A	15 (103.4 kPa)	40 (275.8 kPa)	5
I, class B	15 (103.4 kPa)	20 (137.9 kPa)	5
II	7 (482.3 kPa)	15 (103.4 kPa)	5
IV	7 (482.3 kPa)	15 (103.4 kPa)	5
V	15 (103.4 kPa)	80 (551.5 kPa)	5
VI	15 (103.4 kPa)	80 (551.5 kPa)	5
VII	15 (103.4 kPa)	80 (551.5 kPa)	5

1/ Pounds per square inch.

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3.4.5 Leakage test. Drums shall not leak when subjected to the internal air pressure (see 4.4.4), for applicable type, specified in table I.

3.4.6 Seams. Seams on drums shall not leak, fracture or show evidence of separation when tested as specified in 4.4.5.

3.4.6.1 Side seam. Drum body side seam shall be electric welded, except that repairs by gas welding are acceptable. The maximum length of repair shall be 3 inches (76 mm).

3.4.6.2 Double seam. Top heads of types I, class A, and II and all bottom heads of drums shall be double seamed to the shells or bodies as shown in figures 1, 2 and 4, as applicable, with the compound specified in 3.3.2.

3.4.7 Rolling hoops. Rolling hoops shall be expanded or rolled as shown on figures 1, 2 and 4, as applicable. There shall be no other corrugations in the sides.

3.4.8 False wire. The false wire in the tops of type I, class B, and type IV open head drum shell or body shall be formed as shown on figure 4. The false wire diameter shall be 1/2 ± 1/16 inch (12.7 mm ± 1.6 mm).

3.5 Components.

3.5.1 Gaskets. Each drum closure shall be provided with a new gasket in accordance with MIL-G-432. Polyethylene gaskets may be used for product other than hydrocarbons. Removable cover shall be furnished with a rubber gasket, tubular synthetic, flowed-in, or sponge type, uniformly distributed about the circumference of the cover. The gasket material shall be of sufficient thickness and resiliency to provide a seal that will not leak, when tested in accordance with 4.4.3, 4.4.4, and 4.4.5.

3.5.2 Agitator. When specified (see 6.2), drums shall be provided with a commercial agitator. The drum shall have a 1-1/2 (38 mm) or 2-inch (51 mm) opening in the center of the head for the agitator. The agitator shall consist of a drive shaft extending the entire length of the drum, a single blade or double blades attached to the drive shaft, and a bearing for the drive shaft attached to the bottom of the drum. A detachable handle for the operation of the agitator shall be furnished and clips shall be provided for storage of the handle on the top of the head. Subject to approval by the procuring activity, other commercially available designs and constructions may be furnished.

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3.5.3 Closures.

3.5.3.1 Types I, class A, and type II closed head drums. The closures for types I, class A and type II drums shall conform to PPP-P-420, except that the minimum zinc plating thickness shall not include the threaded surface, and the salt spray test shall be 32 hours in lieu of 96 hours. When used for drums for lubricating oils (see 6.1 and 6.2) the plugs shall not be coated. Closures shall consist of flanges with a 2-inch (51 mm) filler plug, and a 3/4-inch (19 mm) vent plug, located diametrically opposite each other, in the head of the drum, as shown in figures 1 and 2. The flanges installation, onto the drum, and torque test shall be in accordance with PPP-P-420. If plug gaskets are damaged during torque tests, new gaskets shall be applied before acceptance.

3.5.3.2 Types I and II drums with agitator. A commercial 2-inch (51 mm) mechanically inserted type flange and filler plug closure shall be provided in the shell or body of the drum, located where specified (see 6.2).

3.5.3.3 Type I, class B and type IV openhead drums. The closure for type I, class B and type IV openhead drums shall be fully removable heads or covers. The heads or covers with gaskets installed as specified in 3.4.1 shall be secured to the false wire by a bolted locking ring. The locking ring for type I, class B and type IV drums shall be fabricated from 12 gage steel specified in 3.3.1, table II. Lugs for type I, class B and type IV shall be drop forged or bar stock and one of the lugs shall be threaded to receive the bolt. Lugs shall be at least 1/2 inch (13 mm) apart when bolt ring is tightened to close the drum. The diameter of bolts for type I, class B, and type IV drums shall be minimum 5/8-inch (16 mm). Bolts shall be long enough to provide adequate engagement with or through the lug to insure that the cover is sealed. Bolts shall be provided with commercial jam nuts.

3.5.4 Cap seals. When specified (see 6.2), closures in types I, class A, and type II drums without agitators (see 3.5.3.1) shall be provided with cap seals. The seals shall be of a color specified (see 6.2). The seals shall be capable of being applied to the closures (see 3.5.3.1) with hand tools. The seals shall not leak, when tested at 5 pounds per square inch (34.5 kPa) air pressure as specfied in 4.4.6 and shall not be capable of being removed from the closure without breaking or tearing.

3.5.5 Chime reinforcement ring. The chime reinforcement ring for type I, class A and B drum and type V and VII shall be a snug fit and as shown in figure 1. When tested as specified in 4.4.7, the chime reinforcement ring shall reinforce the double seams and assure a proper chime fit. Type I, class A drums shall have both chimes reinforced and type I, class B drums only the bottom chime reinforced.

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3.6 Finish.

3.6.1 Cleaning and phosphatizing. When specified (see 6.1 and 6.2), phosphate treatment or zinc coatings shall be applied to any surface of the drum, chime reinforcement, or closure. The interior and exterior surfaces of all drums except type IV drums and chime reinforcement shall be free of oil, dirt, rust, scale, (see 3.3.1.1) and other foreign matter prior to the application of a phosphate treatment. All sharp edges and metal splinters shall be removed. Unless otherwise specified herein, the entire outside surface shall be, and the inside surface may be, given a phosphate treatment and dried. The phosphate treatment shall produce a uniform adherent minimum phosphate deposit of 150 mg (milligrams) per square foot (1615 mg per square meter) with use of the zinc phosphate type of treatment, or 40 mg per square foot (1615 mg per square meter) with the iron phosphate type, when tested as specified in 4.4.8.

3.6.2 Painting. The color and paint shall be that used by the supplier in his standard commercial practice. When specified (see 6.2), the color shall be olive drab No. 24087 of FED-STD-595 and the paint shall conform to TT-E-485 or equal. After phosphatizing as specified in 3.6.1, the exterior of the drum (including plugs) shall be painted and dried. Drums which were coated in the flat, shall after welding, have the unpainted side seam cleaned, phosphated, and painted. The inside surface of the chime reinforcement and the double seam on type I, class A and B, type V and type VII drums after forming (see 3.5.5) shall be coated with paint. The painted area of the double seam shall extend not less than 1/8-inch (3.2 mm) beyond the chime reinforcement. The double seams shall be painted prior to applying chime reinforcement. The chime reinforcement ring shall be applied while the paint on the double seam is wet. The film thickness of dried coating shall be a minimum of 0.0008 inches (0.02 mm) when tested as specified in 4.4.9. The coating shall show no evidence of flaking off or jagged edges, and shall show good adhesion and shall be difficult to furrow when tested as specified in 4.4.10. The type VI drums shall not be painted except when specified (see 6.2), and when specified (see 6.2), shall be painted on the outside surface with paint specified in TT-E-485. The color shall be olive drab No. 24087 of FED-STD-595.

3.6.3 Lining. Drums used to package materials which would have a deleterious effect on bare drum metal, or vice versa, shall be lined on all internal surfaces with a material that will neither affect nor be affected by the material packaged. A certificate of compliance of material(s) specified herein shall be provided to the contracting officer, (see 4.3.1.1 and 6.2).

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3.6.4 Unlined drums

3.6.4.1 Fog-spray for unlined drums. When specified (see 6.1 and 6.2), drums shall be fog-sprayed inside. Gasket areas, if unplated or uncoated, shall be coated with rust-preventative oil. The spraying shall be done on a dried surface, after exterior painting has been completed, and prior to the final insertion of plugs or removable head closures. The fog-spray shall consist of between 20 cc (cubic centimeters) to 25 cc of rust-preventative oil dispensed through an accurate metering device. The preservative oil shall conform to VV-L-800. The interior drum surface shall be wetted with the specified oil. The fog-spray shall be applied at temperatures not exceeding 140°F. Air lines used for fogging shall have moisture traps to prevent condensate entering the drums. Closure plugs shall be inserted immediately after fogging. The inside surface of removable head closures shall be fogged prior to being attached to the drum.

3.6.4.2 Unlined drums susceptible to contamination. When unlined drums are to be used for a product susceptible to contamination, the drums shall not be fog-sprayed as specified in 3.6.4.1.

3.7 Identification marking. Marking of drums shall be in accordance with the applicable DOT specification or other applicable rules. When empty drums are procured by the Government, each drum shall be embossed with "US". The "US" may be omitted when the drum is procured incident to procurement of the product contained therein. Containers shall be marked on the lower one third of the side wall in letters at least 1/4-inch (6.35 mm) in size as follows.

CONTAINER CONFORMS TO PPP-D-729, TYPE _____ CLASS _____ (when applicable).

3.8 Workmanship. Finished drums shall be clean and free from rust, loose slag, or dents. There shall be no nicks, creases or malformed area on the rolling hoops. Welds shall be free of burrs, splatter cracks, or incomplete fusion. Spot welds, if used, shall be free from flash or burn-through. Seaming compound shall not protrude more than 1/2-inch (12.7 mm) beyond the inner or outer surface to which applied. There shall be no surplus oil collected in pools or rings in the bottom of the drum. Coatings or painted surfaces shall be adherent, free of blisters, imbedded foreign matter, wrinkles, runs, no areas of thin film or no film and crazing. Threaded areas shall not have the threads missing, stripped, or fractured. The lugs on the bolt ring shall be at least 1/2-inch (12.7 mm) apart when the bolt ring is tightened to close and seal the drum. There shall be no evidence of leaking when the drums are filled. Markings shall be complete and legible.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the 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 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 assure supplies and services conform to prescribed requirements.

4.2 Certification. The tests specified in 4.4.3 and 4.4.5 are not required provided the production run is to be 1000 drums or less; the design, materials, and manufacturing processes have not been changed, and the drum manufacturer has available the last specimen tested for compliance with applicable DOT regulations. A certified statement shall be furnished the procuring activity, with a copy of the reports and drawings of the last tests made.

4.3 Quality conformance inspection. Except as otherwise specified herein, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.3.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.3.1.1 Certificate of compliance. Where certificates of compliance are submitted to determine compliance with 3.6.3, the Government reserves the right to check or test such items to determine the validity of the certification.

4.3.2 In-process inspection.

4.3.2.1 Descaling. A sample of the hot-rolled sheet steel, size 3 by 6 inches (76 mm by 152 mm), used in the fabrication of drum components shall be taken at random each 24 hour period from the production line and tested in accordance with 4.4.1. Any failure to pass the test or to readjust the descaling process to pass the test shall be cause for rejection of the lot in-process.

4.3.2.2 Phosphate coating. Three samples of the sheet steel used in the fabrication of the drum shall be phosphate coated using the same process as used on the drums. The sample shall be prepared during each 4 hours of production or fraction thereof. The phosphate coating shall be tested in accordance with 4.4.8 prior to acceptance of the lot. Any nonconformance shall be cause for rejection of the lot in-process.

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4.3.3 End item inspection. A lot shall consist of all drums of the same type offered for inspection at one time. The sample unit shall be one completely finished drum.

4.3.3.1 Visual examination. Examination shall be made of the end item for the defects listed in table II. The inspection level shall be S-3 with an acceptable quality level (AQL) of 1.5 for major defects and 6.5 for total defects, expressed in terms of defects per hundred units.

TABLE II. Classification of visual defects

Examine	Defect	Classification Major	Minor
Material	Fracture	X	
	Dents over 1/4 inch (6.35 mm) deep		X
Steel	Creased or lapped (mill defect)	X	
Side seams of all drums	Not continuous	X	
	Not electric welded (except for repairs made by gas welding)	X	
	Repairs over 3 inches (76.2 mm)	X	
Rolling hoops all drums	Other corrugations in sides	X	
	Not number specified	X	
Components			
Gaskets	Missing	X	
	Not type specified		X
	Not uniformily distributed		X
	Damaged	X	
Plugs	Missing	X	
	Seat not smooth		X
	Less than three threads contacting with threads of flange when screwed tight, with gasket in place		X
	Filler plug not diagonally opposite vent plug		X
Flanges	Pitted sealing area	X	
Agitator (when required)	Handle missing		X
	Handle not properly secured		X

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TABLE II. Classification of visual defects (cont'd)

Examine	Defect	Classification Major	Minor
Type I, class A drums			
Chime reinforcement	Missing	X	
	Fractured or split	X	
	Clearance between bottom of chime ring and drum head less than specified	X	
	Chime ring not applied when double seam is wet from paint		X
Type I, class B, and type IV drums	Covers do not fit over false wire	X	
	Locking ring has no clearance		X
	Locking ring not proper gage thickness	X	
	Jam nut missing		X
	Sixteen gage covers without corrugation (type IV only)	X	
	Wrong size bolt	X	
Cap seals (when required)	Missing	X	
	Color not specified		X
Finish	Not paint specified	X	
	Color not as specified		X
	Area of no paint (this defect does not apply to the outside of chime or where paint has been scuffed by handling or rolling drums on the chime or rolling hoops)	X	
	Tacky, not properly dried		X
	Sharp edges and metal splinters	X	
	Plugs not coated (when required)		X
Cleaning prior to phosphate treatment (when required)	Not clean, rust, loose scale, metal particles or foreign matter	X	
Lining	Missing (when required)	X	
Phosphate treatment (when required)	Omitted	X	
	Entire outside surface not coated	X	
	Not uniform	X	
	Chime reinforcing ring interior not coated	X	

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TABLE I Classification of visual defects (cont'd)

Examine	Defect	Classification Major	Classification Minor
Fog-spray (when required)	Not completely fog-sprayed		X
Identification marking	Omitted or incorrect	X	
	Location, size, or sequence not as specified		X
Workmanship	Not clean and free from rust, loose slag, or dents		X
	Nicked, creased, or malformed areas on the rolling hoops	X	
	Improper application of linings or components	X	
	Burrs or flash splatter in welded areas		X
	Cracks or incomplete fusion of welds	X	
	Spot weld burned through	X	
	Solder used for repairs	X	
	Seaming compound protrudes more than 1/2 inch (12.7 mm)		X
	Excess oil		X
	Paint does not adhere	X	
	Paint blistered, covering imbedded material, wrinkled or crazed		X
	Threads stripped, missing, or cracked	X	
	Lugs closer then 1/2 inch (12.7 mm)	X	
	Filled drums leak	X	
	Markings not complete or legible	X	

4.3.3.2 Dimensional examination. Inspection shall be made to determine compliance with specified dimensions. Any deviations from specified dimensions shall constitute a defect. One sample taken at random from the lot shall be examined for compliance.

4.3.3.3 Testing of the end item. The drums shall be tested as specified in table III.

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TABLE III End item testing

Test	Reference paragraph	Test results	Inspection level and AQL expressed in terms of defects per hundred units
Capacity	4.4.2	Fail or pass	One sample taken at random from each lot
Strength	4.4.3	Fail or pass	S-1 and AQL of 2.5 1/
Drop	4.4.5	Fail or pass	All types and classes One sample taken at random from each lot 1/
Leak	4.4.4	Fail or pass	Each drum shall be tested for leaks 2/
Cap seal	4.4.6	Fail or pass	S-1 and AQL of 2.5
Paint	4.4.9	Fail or pass	S-1 and AQL of 2.5
Knife	4.4.10	Fail or pass	S-1 and AQL of 2.5

1/ Type 1, classes A and B drums shall, after strength and drop test, have the chime reinforcement ring examined as specified in 4.4.7.

2/ In addition to tests specified in 4.4.4 open head drums, type I, class B, and IV, shall be closed for use and tested as specified in 4.4.4. The inspection level and AQL for this additional test for type I, class B shall be S-1 and AQL of 2.5, expressed in terms of defects per hundred units. A sample of the type IV drum from the first production lot shall be closed for use and tested as specified in 4.4.4 and the test repeated every four months. Samples of the last tested and accepted drum shall be retained until further tests are made.

4.3.4 Examination of preparation for delivery. The inspection of the packing and marking shall be in accordance with the requirements of section 5.

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4.4 Tests.

4.4.1 Descaling test. A sample of sheet steel, size 3 by 6 inches, (76 x 152 mm) after descaling, but prior to phosphatizing, shall be swabbed on the surfaces of both sides. Each side shall be swabbed for 2-seconds, with a clean cotton swab saturated with cooper sulphate (blue vitriol) solution consisting of 200 grams of copper sulfate dissolved in 500 cc of water to which 27 cc of concentrated sulfuric acid, specific gravity 1.84, is added. The solution shall then be made up with water to 1000 cc. The sample shall be rinsed immediately in clear running water for 1-second and the surface area shall be checked immediately for scale-free areas showing a uniform deposit and dark areas shown no deposit on the unremoved mill scale. An estimate of the accumulated area of the dark areas in percent of area swabbed shall then be made to determine compliance with 3.3.1.1.

4.4.2 Capacity test. The capacity of the drum shall be determined for conformance with 3.4.3 in accordance with Method 5010 of FED-STD-101.

4.4.3 Strength test. The strength of the sample drum shall be determined for comformance with 3.4.4 and 3.5.1 by filling the drum with tap water and connecting to a hydraulic pressure system. The applicable applied pressure shall be as specified in table I. The pressure gages used shall have an accuracy of 1 percent at the pressure specified in table I.

4.4.4 Leak test. Drums shall be subjected to the applicable internal air pressure (see table I), seams submerged in water, covered with soap suds or heavy oil, and then checked for leaks to determine compliance with 3.4.4 and 3.5.1. Other equally efficient means of conducting this test will be authorized upon demonstration and proof of satisfactory results to the purchasing agency and provided that the method has been approved by the Bureau of Explosives. Removable top head drums may be tested with top head removed except as specified in footnote 2 of table III.

4.4.5 Drop test. The type I, II and IV drums shall be filled with water to 98 percent of its rated capacity, closed as for use, and dropped from a height of 4-feet (1.2 m) onto a solid concrete floor. Type V, VI, and VII drums shall be dropped from a height of 6 feet. The drums shall fall with the head containing the closures downward at an angle of approximately 45 degrees so that the bung or the bolt area or any other part considered to be weaker is within the impacted area. The drums shall then be checked for leaks immediately on impact and after 5 minutes to determine compliance with 3.4.5 and 3.5.1.

4.4.6 Cap seal test. The 2-inch (51 mm) opening in the drum shall first have a cap seal applied without the plug in place. An air pressure of 5 psi (34.5 kPa) shall be applied to the 2-inch (51 mm) cap seal through the 3/4-inch (19 mm) opening and the seal then checked for leaks to determine compliance with 3.5.4.

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the seal on the 2-inch (51 mm) opening shall be removed and the breaking and bearing characteristic determined for compliance with 3.5.4. The 3/4-inch (19 mm) opening shall be cap sealed and the test repeated, applying the pressure through the 2-inch (51 mm) opening.

4.4.7 Chime reinforcement ring test. At the conclusion of test in 4.4.3 and 4.4.5 on type I drum a "V" section shall be cut from the undamaged section of the reinforced chime and the section then checked to determine compliance with 3.5.5.

4.4.8 Phosphate coating test. Three specimen panels, size 3 x 6 inches, (76 x 152 mm) of the same metal as the drums, shall be processed through all the cleaning and phosphating steps taken along with the drums. Each specimen shall be accurately weighed and surface area calculated. The specimens shall be immersed in a 5 percent chromic acid solution at 165°F (73.9°C) for 15 minutes. After immersion, each specimen shall be rinsed in clean running water, dried and weighed. Repeat the process until the weights obtained by successive weighings become constant. The chromic acid shall be used one time only. The coating weight shall be calculated from the following formula:

$$\text{Coating weight} = \frac{\text{Loss in weight (mgs)} \times 144}{\text{Coated area (square inches) (mm)}}$$

(both sides of coated specimen)

The average of the test results for the three (3) panels shall then be taken as coating weight to determine compliance with 3.5.1.

4.4.9 Paint thickness test. Paint thickness on heads and sides shall be measured in accordance with Method 6181 of FED-STD-141.

4.4.10 Knife test. A furrow shall be made on the painted surface of the drum, with a knife blade held at an angle of 30 degrees and the removal of the paint film by this operation shall then be checked to determine compliance with 3.6.2.

5. PREPARATION FOR DELIVERY

5.1 Level C packing. The drums shall be prepared for shipment in a manner to insure carrier acceptance and safe delivery at destination at lowest transportation rate for such supplies. Shipments shall be in accordance with the Uniform Freight Classification or National Motor Freight Classification, as applicable. Unless otherwise specified (see 6.2), type I, class B and type IV drums shall have the cover secured in place with the locking ring and bolt.

5.2 Marking. Marking shall be in accordance with 5.2.1 or 5.2.2 as specified (see 6.2).

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5.2.1 Military requirements. In addition to any marking specified in the contract or order, shipments shall be marked in accordance with the requirements of MIL-STD-129.

5.2.2 Civil agencies. Shipments shall be marked in accordance with the requirements of FED-STD-123.

6. NOTES

6.1 Intended use. The steel drums covered by this specification are intended primarily to be used for storage and shipment of noncorrosive and corrosive materials

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents

(a) Title, number, and date of this specification.
(b) Type and class required (see 1.2.1).
(c) When first article inspection and test is required (see 3.1 and 6.4).
(d) Other type of seaming compound required (see 3.3.2).
(e) When 20 gage (0.0359) nominal (0.911 mm) steel for type II drum body is authorized (see 3.4).
(f) When vents are required (see 3.4.1).
(g) When agitators are required (see 3.5.2).
(h) When fill and empty closures are required in type I and II drums with agitator and location of 2-inch (51 mm) opening (see 3.5.3.2).
(i) When cap seals on type I, and class A and type II drums are required and color required (see 3.5.4).
(j) When phosphate coating is required and when uncoated carbon steel flanges, plugs, and interiors are required (see 3.6.1 and 6.1).
(k) Color, if other than specified (see 3.6.2).
(l) When type VI drum exteriors should be painted (see 3.6.2).
(m) When liners or linings are required (see 3.6.3).
(n) When interior oil fog-spray is required (see 3.6.4.1 and 6.1).
(o) When type I, class B and type IV covers are not required to be secured (see 5.1).
(p) Whether marking shall be military or civilian (see 5.2.1 or 5.2.2).

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6.3 First article (for military). When a first article is required, it should be inspected and approved under appropriate provisions of MSPR 7-104.55. The first article should be a preproduction sample of the specified type drum and should consist of two complete drums. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for inspection and approval of the first article. First article is not normally required for orders under 1000, or when drums are used as a packaging media in small quantities. The procurement document should be properly anotated.

6.4 Supersession data. This revision of PPP-D-729 supersedes PPP-D-700C as follows:

PPP-D-729	PPP-D-700
Type V	Type I
Type VI	Type II
Type VII	Type III

Type III of PPP-D-729D has been deleted from this revision and is now included in PPP-D-711E.

Custodians:

Army - GL
Navy - SA
Air Force - 69

Review activities:

Army - MI, EA, MD
Navy - AS, SH
Air Force - 99
DSA - GS, FS, SS

User activities:

Army - MU, AT
Navy - MC, MS

Preparing activity:

Army - GL

Civil Agency Coordinating Activities:

AGR - APS
COM- NBS
GSA - FSS
HEW - NIH

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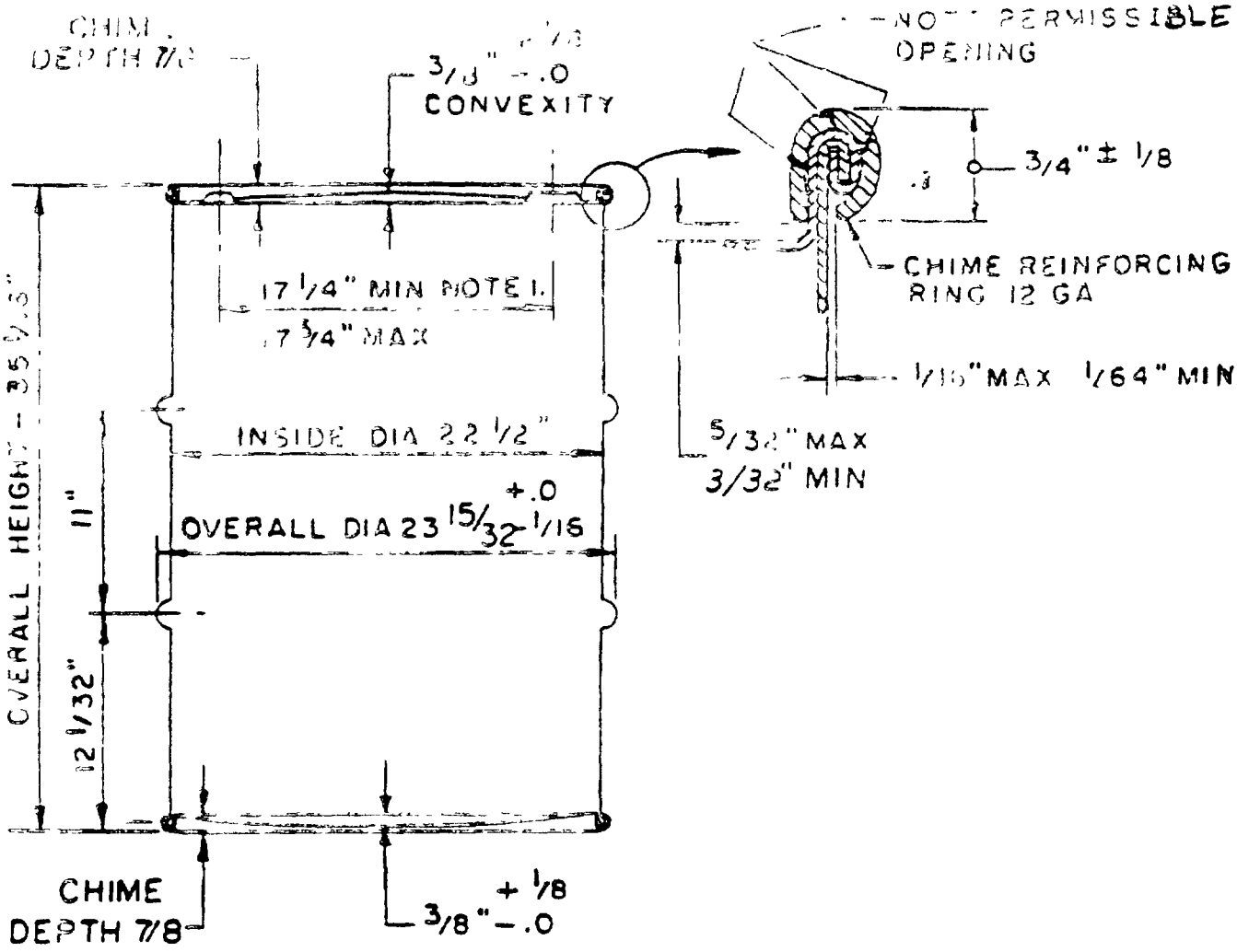

TOLERANCES:
ON OVERALL HEIGHT, AND ROLLING HOOP SPACING ± 1/8"
ON OTHER DIMENSIONS ± 1/16" EXCEPT AS NOTED

NOTE:
1. THESE DIMENSIONS ARE FROM CENTER TO CENTER OF FITTING

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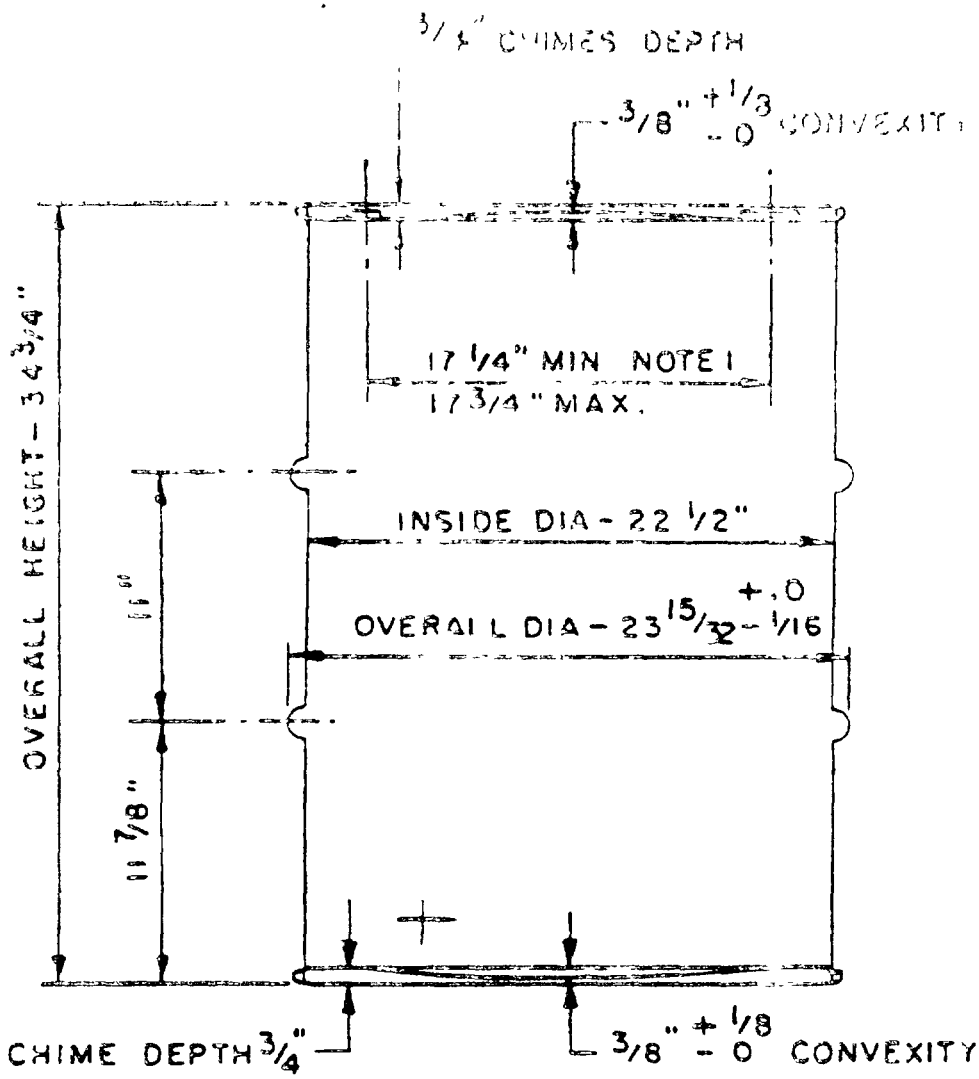

TOLERANCE

ON OVERALL HEIGHT, AND ROLLING HOOP SPACING ± 1/8"
ON OTHER DIMENSIONS ± 1/16" EXCEPT AS NOTED
NOTE 1. THESE DIMENSIONS ARE FROM CENTER TO CENTER OF FITTINGS

FIG 2 - TYPE II 55-GALLON STEEL DRUM (DOT-17E)

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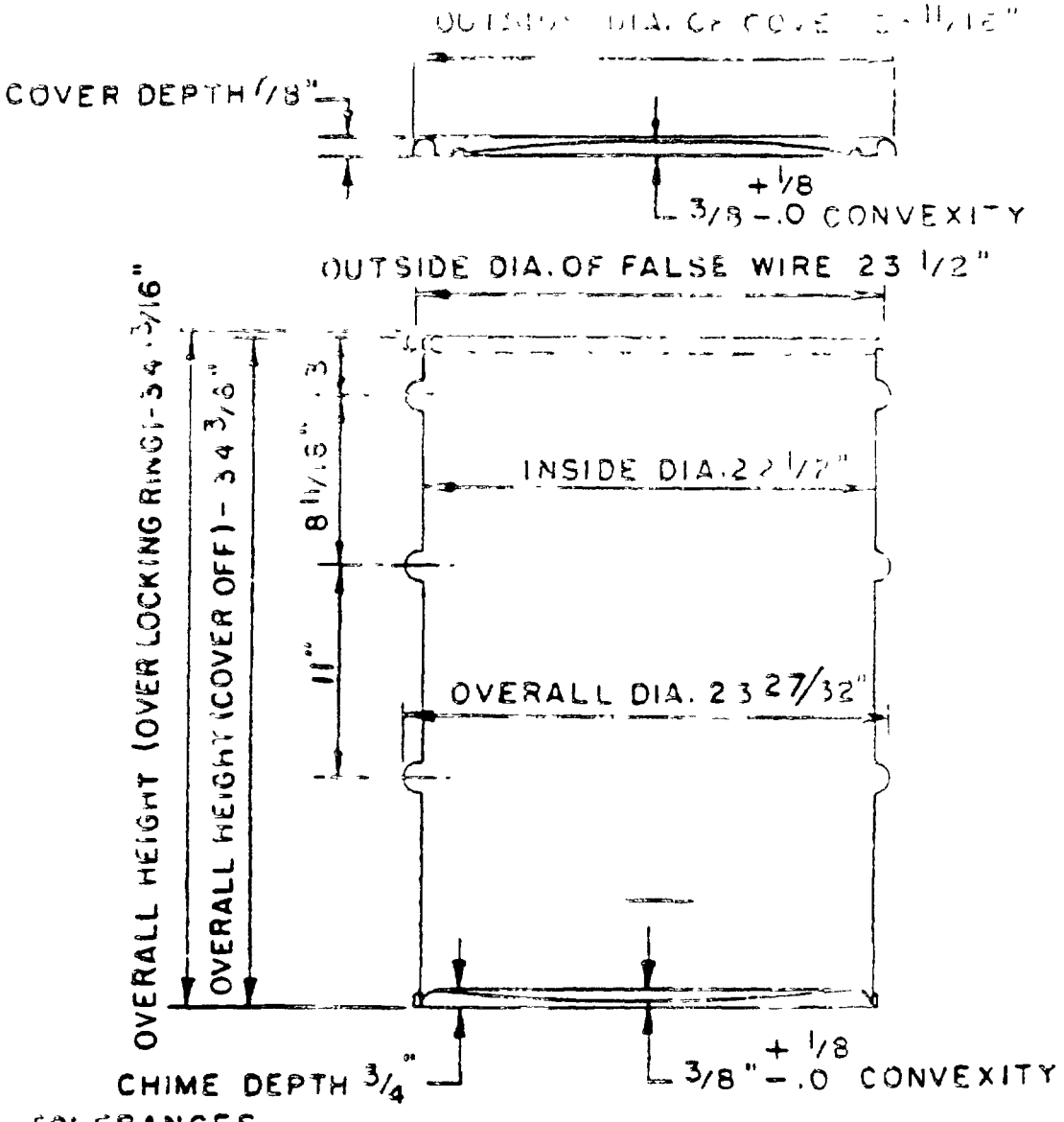

TOLERANCES.

ON OVERALL HEIGHT AND ROLLING HOOP SPACING ± 1/8" OTHER DIMENSIONS ± 1/16" EXCEPT AS NOTED

FIG. 4 - TYPE IV, 55 - GALLON STEEL DRUM (DOT - 17H)

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1. DOCUMENT NUMBER

2. DOCUMENT TITLE

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4. TYPE OF ORGANIZATION (Mark one)

- ☐ VENDOR
- ☐ USER
- ☐ MANUFACTURER
- ☐ OTHER (Specify) _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording

b. Recommended Wording

c. Reason/Rationale for Recommendation

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) – Optional

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