

METRIC

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SUPERSEDING
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MILITARY SPECIFICATION

CONTAINERS, NESTABLE OR COLLAPSIBLE, REUSABLE, SHIPPING
AND STORAGE, ASSEMBLED EXTERNAL AIRCRAFT FUEL TANKS

This specification is approved for use by the AF Packaging Evaluation Activity, (HQ AFLC/LGTPM) of the Air Force, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers requirements for reusable, nestable or collapsible, shipping and storage containers for assembled external aircraft fuel tanks (see 6.1).

1.2 Classification.1.2.1 Types.

Type I Nestable Container
Type II Collapsible Container

1.2.2 Classes and styles. The containers shall be of the following classes and styles as specified (see 6.2 and 6.3):

- a. Class 1 - To accommodate fuel tanks longer than 6800mm (268 inches) length.
- b. Class 2 - To accommodate fuel tanks ranging in length from 6100mm (240 inches) to 6800mm (268 inches).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: HQ AFLC/LGTP, Wright-Patterson AFB, OH 45433-5999 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8145

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c. Class 3 - To accommodate fuel tanks less than 6100mm (240 inches) in length.

1.2.2.1 Styles. Each class of containers shall have two styles:

- a. Style A - One tank container.
- b. Style B - Two tank container.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2)

SPECIFICATIONS

Federal

A-A-208	Ink, Marking, Stencil, Opaque (Porous and Non-porous Surfaces)
TT-C-490	Cleaning Methods for Ferrous Surfaces and Pretreatments for Organic Coatings
TT-E-515	Enamel, Alkyd, Lusterless, Quick-drying

Military

MIL-P-116	Preservation, Methods of
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-P-15930	Primer Coating, Shipboard, Vinyl - Zinc Chromate (Formula No. 120)
MIL-P-16232	Phosphate Coating, Heavy, Manganese or Zinc Base (for Ferrous Metals)
MIL-P-19834	Plates, Identification or Instruction, Metal Foil, Adhesive Backed General Specification For
MIL-T-31000	Technical Data Packages, General Specification For

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STANDARDS

Federal

FED-STD-101	Test Procedures For Packaging Materials
FED-STD-595	Colors

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-648	Design Criteria for specialized Shipping Containers
MIL-STD-831	Test Reports, Preparation of
MIL-STD-889	Dissimilar Metals
MIL-STD-1791	Designing for Internal Aerial Delivery in Fixed Wing Aircraft

Unless other wise indicated, copies of federal and military specifications, standards, and handbooks are available from Military Specification and Standards, Building 4D, 700 Robbins Ave., Philadelphia PA 19111-5094.

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), 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 First Article inspection. This specification makes provisions for First Article inspection (see 4.4).

3.2 Materials. Materials shall conform to the requirements specified and specifications and drawings referenced herein or as otherwise specified by the procuring activity (see 6.2). The use of wood or magnesium is prohibited.

3.2.1 Commercial parts. Commercial parts having suitable properties may be used where, on the date of invitation for bids or request for proposal, there are no suitable standard parts. In any case, commercial utility parts, such as screws, bolts, nuts, and cotter pins having suitable properties may be used, provided:

- a. They can be replaced by standard parts (MS or AN) without alteration.

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b. The corresponding standard part numbers are referenced in the parts list and, if practicable, on the contractor's drawings.

3.2.2 Standard parts. Except as permitted in 3.2.1, MS and AN standard parts shall be used where they suit the purpose. They shall be identified on the drawings by their part numbers.

3.2.3 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals as defined in MIL-STD-889 shall not be used in intimate contact with each other.

3.3 Design and construction. The container shall be an open, structural frame construction as specified in applicable referenced drawing(s) (see example in Figures 1 and 2). The container shall be of minimum cube and weight to contain the items as specified herein. The container shall be designed to safely constrain, transport and protect without damage to the applicable fuel tank(s) and accessories. The container shall provide features and capabilities specified herein which when tested in accordance with section 4 will assure quick and easy accomplishment of operations such as securing and removing of tank(s); erecting and collapsing of container; handling; tiedown; stacking and transporting of the container(s).

3.3.1 Standardization. The container's individual component parts (such as saddles, straps, rails, pins, etc.) shall be so designed that they will be standard and universal in application to the maximum extent possible throughout the various classes of containers (see 1.2).

3.3.2 Tank mounting provisions. Each container shall include complete interior supports and attachments to safely, quickly, and easily secure and release the model(s) or type(s) of tank(s) prescribed by the procuring activity (see 6.2).

3.3.3 Nestability. Type I containers shall be capable of being nested to 75 percent of the container's height.

3.3.4 Collapsibility. Type II containers shall be capable of being collapsed to a flat configuration of least possible height not to exceed 25 percent of the container's erected height. The container shall be designed so that all of its component parts shall remain attached to the container when it is empty and in the collapsed configuration (i.e., no loose parts which may be lost). Those parts which may otherwise hang loose or are likely to swing about shall be provided with positive securement provisions similar to those to which they are normally attached.

3.3.5 Stacking and stowing. The container shall be capable of being stacked safely and efficiently during all modes of transportation, in warehouses, magazines, stowed in ships for prolonged periods or in other stacking and storing conditions as specified by the procuring activity (see 6.2).

3.3.5.1 Stacking strength of erected configuration. The fully loaded container (Type I and Type II) in the erected configuration shall withstand, without damage or permanent deformation the conditions specified in 4.6.3. In addition, the Type I container in the nested configuration and the Type II container in the collapsed configuration shall withstand, without damage or

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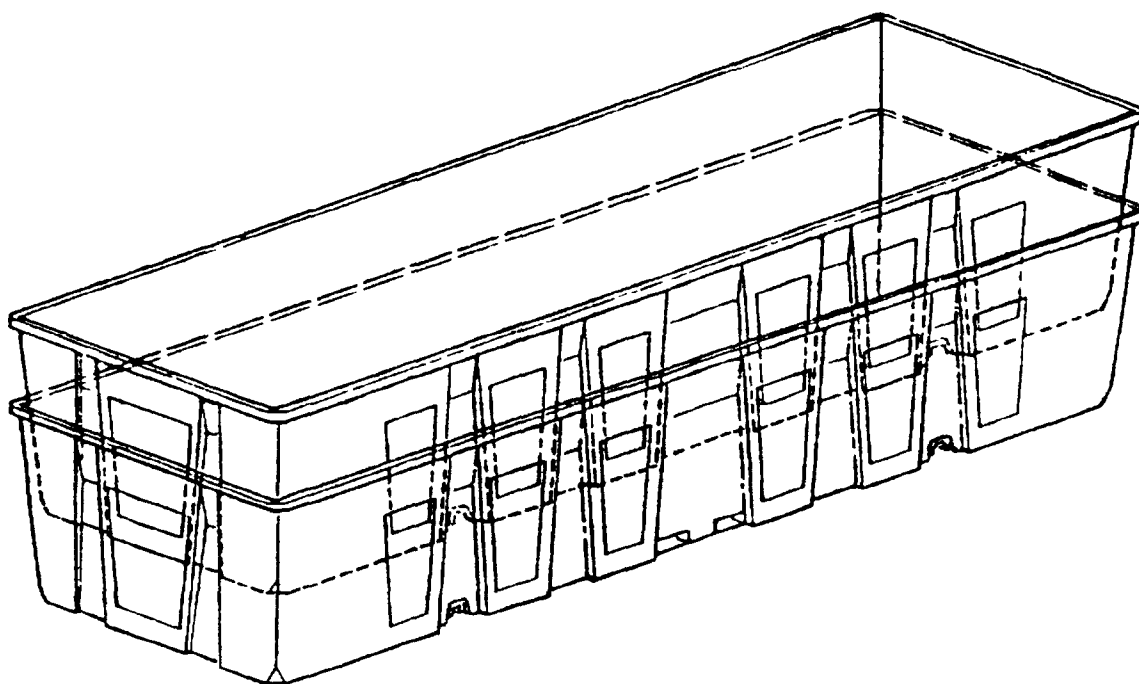


Figure 1. Example of Type I Nestable Container

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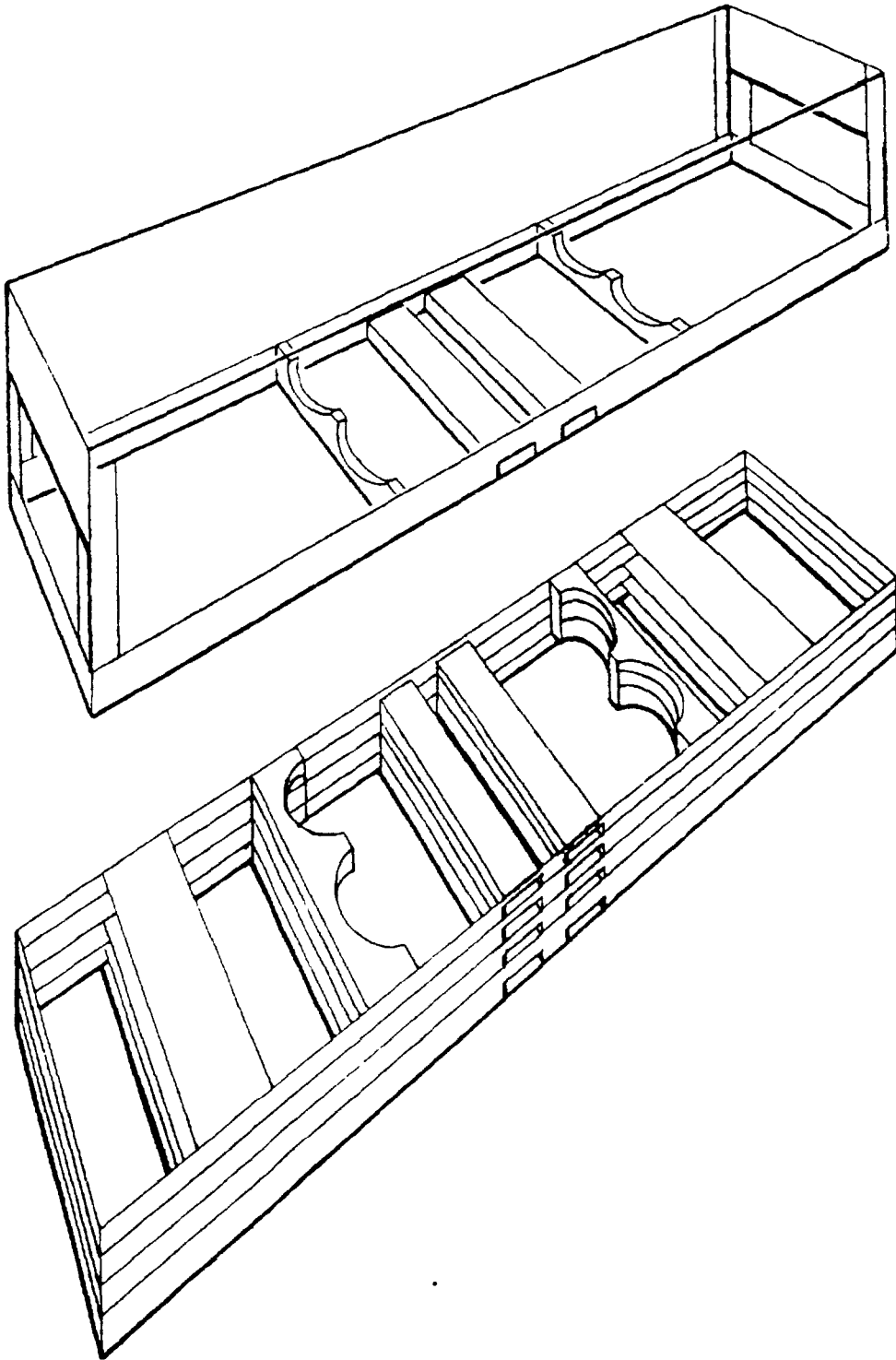


Figure 2. Example of Type II Collapsible Container

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permanent deformation, the conditions specified in 4.6.3.

3.3.6 Handling provisions. The container shall be provided with forklifting, hoisting, towing, and tiedown provisions relative to the size and maximum gross weight expected to be handled or constrained. Handling provisions such as rings, eyes, lugs, etc., when not in use, shall not extend beyond the limits of maximum displacement of the container. Rings and eyes shall have a minimum inside diameter of 64mm (2.5 inches) for containers with a maximum gross weight of 1,000kg (2200 pounds) and a minimum inside diameter of 75mm (3 inches) for containers with gross weights over 1,000kg (2200 pounds). Whenever practical, the hoisting, towing, and tiedown provisions should be incorporated into one container feature.

3.3.6.1 Forklifting. Forklift entries shall be provided from both sides of the container. The Forklift entry shall have a clear minimum height of 75mm plus 3 or minus zero mm (3 inches plus .1 inch minus 0 inch). Width and spacing shall be in accordance with MIL-STD-648. Forklift handling of the container shall exhibit no significant instability on the tines (e.g. out of balance, tending to fall off or capsize) or tendency of the tines to permanently deform, fracture or puncture the container when tested as specified in 4.6.4.1.

3.3.6.2 Hoisting. Hoisting provisions shall, in addition to the requirements in 3.3.6, be placed as far away from the loaded center of balance as the strength of the container will safely permit, to achieve the optimum handling stability. Hoisting provisions shall not create any unsafe, awkward, time consuming or potentially dangerous handling conditions or any permanent deformation of the hoisting provisions or supporting structure when tested in accordance with 4.6.4.1.

3.3.6.3 Towing. Towing provisions shall, in addition to the requirements 3.3.6, be placed where they can be easily accessed from the end of the container. Towing provisions shall be capable of safely supporting the fully loaded container when tested in accordance with 4.6.4.1.

3.3.6.4 Tiedown. Tiedown provisions shall, in addition to the requirements in 3.3.6, be compatible with the attachment points on aircraft cargo floors which, in general, have a minimum capacity of 4,500kg (10,000 pounds) and are spaced on 508mm (20 inch) centers. There shall be a minimum of two tiedown provisions provided on each of the longest sides of the container and a minimum of one tiedown provision on each end of container if wider than 1500mm (59 inches). Tiedown provisions shall not create any unsafe, awkward, time consuming or potentially dangerous handling conditions or any permanent deformation of the tiedown provisions or container when tested in accordance with 4.6.4.2.

3.3.7 Dynamic tests. The fully loaded container shall be capable of withstanding the dynamic tests in 4.6.2 without any permanent deformation or creation of potentially dangerous handling conditions.

3.3.8 Drainage. The container shall exhibit free drainage of water from all pockets and surfaces. Standing water in pockets or surface puddles in excess of 3mm (.12 inch) deep or 6452mm (10 square inches) in surface area, not cumulative, shall be cause for rejection (see 4.7).

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3.4 Finish.

3.4.1 Surface treatment. Aluminum and aluminum alloy, parts not otherwise protected, shall either be anodized in accordance with MIL-A-8625 or shall be given other surface protection as may be specifically authorized by the procuring activity. Ferrous metal surfaces shall be treated in accordance with TT-C-490, method V, type III except that threaded or other working surfaces shall be treated in accordance with type M, class 4B of MIL-P-16232.

3.4.2 Painting. All ferrous metal surfaces not resistant to corrosion shall be painted with one coat of primer conforming to MIL-P-15930 and one coat of enamel conforming to TT-E-515.

3.4.3 Color. The paint and enamel color shall be number 34087 of FED-STD-595 (Green).

3.5 Identification of product. The containers shall be marked for identification in accordance with MIL-STD-130. The nameplate shall be in accordance with type II of MIL-P-19834.

3.6 Markings. Markings shall be of waterproof ink or paint. Ink shall conform to A-A-208 and paint to TT-E-515. Color of markings shall be white, conforming to color number 37875 of FED-STD-595. The following markings shall be applied to all containers at the locations and in the sizes indicated:

a. Adjacent to the lifting rings, eyes or lugs in 25mm (1 inch) letters:

"LIFT HERE"

b. At the loaded center of balance on both sides of the container, a vertical line 150mm (6 inches) long and 25mm (1 inch) wide with marking adjacent in 25mm (1 inch) letters:

"CENTER OF BALANCE"

c. Along both sides in 50mm (2 inches) letters:

"REUSABLE CONTAINER DO NOT DESTROY"

d. On both ends of style B containers in 75mm (3 inches) letters:

"TWIN PACK"

"TYPE # (appropriate number)"

e. On both ends of style B containers above appropriate tanks in 50mm (2 inches) letters:

"TANK
FWD
END"

"TANK
AFT
END"

f. In 25mm (1 inch) letters designate forklift entries:

"FORKLIFT"

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3.7 Additional markings. Markings other than specified shall be as determined by the procuring activity (see 6.2).

3.8 Workmanship. Containers must meet all the design requirements of this specification. Additionally the container must show no indications of poor fabrication, loose materials, damaged or improperly assembled parts, poor finish, nicks, burrs, warpage, or any other defect which affects the durability, strength, safety or serviceability of the container (see 4.5).

3.9 Unitization. The contractor shall identify all possible unitized load configurations and packing instructions from one container to the maximum number possible of nested or collapsed containers that will optimize handling and transportation by all modes, with weight and safety concerns taken into account (see 4.8).

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) and 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 this 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 inspection 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 accept defective material.

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

- a. First Article inspection (4.4).
- b. Quality Conformance inspection (4.5).

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the applicable test method document or applicable paragraph(s) in this specification.

4.4 First Article inspection. First Article inspection shall consist of one container, representative of production design and construction, subjected

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to all inspections specified herein (see 4.6 and 4.7). A technical representative, approved by the procuring activity, shall witness all First Article tests to assure ability of the container to conform to this specification (see 3.1).

4.4.1 Location of First Article inspection. All tests shall be conducted at the container manufacturer's plant or as specified by the procuring activity (see 6.2).

4.4.2 First Article test report. After the contractor completes the First Article inspection, he shall prepare a First Article test report in accordance with MIL-STD-831. Photographs and a complete set of detail and assembly drawings of the container, in accordance with MIL-T-31000 shall be included with the report. The First Article test report shall be available for review by the government.

4.5 Quality Conformance inspection. Each container submitted for acceptance shall be subjected to and shall pass the examination of product (4.6.1).

4.6 Inspection methods.

4.6.1 Examination of product. Examination of product shall be for defects classified in Table I.

TABLE I

<u>SALIENT CHARACTERISTIC</u>	<u>DESCRIPTION</u>	<u>MAJOR</u>	<u>MINOR</u>
Material	Materials not type as specified, dissimilar, or not protected against electrolytic corrosion.	X	
Components	All parts of the same model will be completely interchangeable with other containers, and comply with 3.2.1 and 3.2.2 requirements.	X	
Workmanship	Containers manufactured shall be free from imperfections that may affect their utility.	X	
Construction	Any component missing or malformed.	X	
	Any detail or feature of fabrication not as specified on drawings.	X	

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TABLE I

<u>SALIENT CHARACTERISTIC</u>	<u>DESCRIPTION</u>	<u>MAJOR</u>	<u>MINOR</u>
Welding	Welds not sound, smooth, or free of craters. Welds not clean of flux, scale, spatter. Rivet heads tight, free of cracks.	X X	 X
Drainage	Pockets on the containers collect water.	X	
Mounting provisions	Supports not designed as specified in drawings. Mounting provisions not standard.	X	 X
Stacking Provisions, Rings, Eyes, Lugs	Not as specified on drawings	X	
Finish	Ferrous/nonferrous metals not treated, primed, painted as specified on drawings.	X	
Collapsibility	(Type II containers) Not collapsible to a flat configuration.	X	
Paint Condition	Paint free of runs or sags. (Scratches in handling areas are acceptable.)		X
Markings	Omitted, incorrect, illegible, of improper size, location, incomplete.		X

4.6.2 Dynamic tests. The container shall be loaded and subjected to the following tests in accordance with FED-STD-101 (see 3.3.7): Unless otherwise specified the temperature tolerance shall be ± 2 degrees C (36 degrees F).

a. Edgewise drop (rotational) test. The container shall be subjected to the edgewise drop test in accordance with Method 5008. One-half of the drops shall be performed at 60 degrees C (140 degrees F) and one-half shall be performed at -40 degrees C (-40 degrees F).

b. Cornerwise drop (rotational) test. The container shall be subjected to the cornerwise drop test in accordance with Method 5005. One-half of the drops shall be performed at 60 degrees C (140 degrees F) and one-half shall be

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performed at -40 degrees C (-40 degrees F).

c. Impact test. An impact test shall be applied to each end of the container, in accordance with either Method 5023 or Method 5012. One-half of the test shall be conducted after 24 hours of conditioning at 60 degrees C (140 degrees F). One-half of the test shall be conducted after 24 hours of conditioning at -40 degrees C (-40 degrees F). The impact test may be conducted at ambient temperature 20 ± 10 degrees C, (68 ± 18 degrees F) provided the test is completed within 15 minutes after removing container from conditioning chamber.

d. Vibration (repetitive shock) test. The container shall be subjected to the vibration test in accordance with Method 5019.

4.6.3 Stacking strength test. The container shall be tested in accordance with Method 5016 of FED-STD-101 except that the load applied shall be equal to that produced by a number of like containers, in the appropriate configuration, when stacked to a minimum of 4.9 meters (16 feet) in height. The test shall be conducted at ambient 20 ± 10 degrees C (68 ± 18 degrees F) for not less than one hour for all metallic containers. The test shall be conducted at +48.8 degrees C (120 degrees F) 90 percent relative humidity for not less than 168 hours for all nonmetallic containers. (see 3.3.5.1, 3.3.5.2)

4.6.4 Mechanical handling tests. The container shall be loaded and subjected to the tests specified herein.

4.6.4.1 Forklifting, hoisting, and towing. The container shall be tested in accordance with the appropriate section of Method 5011 of FED-STD-101 (see 3.3.6.1, 3.3.6.2, 3.3.6.3).

4.6.4.2 Tiedown strength test. Each tiedown provision shall be identified for test purposes. A load shall be applied to each tiedown provision in the same way that it would be applied in service. In the absence of clearly specified tiedown procedures, the load shall be applied at an angle of 45 degrees downward from the horizontal and simultaneously 45 degrees outboard from the container surface. The test load shall be equal to that which would be applied in accordance with 3.3.4 of MIL-STD-1791. The duration of the test shall be one minute in each of the test directions (see 3.3.6.4).

4.7 Drainage. Visual inspection of the container shall be performed to verify the presence of any potential pocket or surface drainage problems. If neither are identified then the requirements of 3.3.8 are met. If discrepancies are noted then water in sufficient quantity to fill pockets or surface voids shall be applied to containers to verify if the requirements of 3.3.8 can be met.

4.8 Inspection of packaging. Nested containers Type I or unitized containers Type II shall be inspected to verify the stability and safety requirements (see 3.9) have been met. Preservation and interior package marking shall be in accordance with groups A and B quality conformance inspection requirements of MIL-P-116 when commercial packaging is not specified. The inspection of marking for shipment and storage shall be in accordance with MIL-STD-129. The inspection of commercial packaging shall be as specified on the contract (see 6.2).

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5. PACKAGING

5.1 Preservation. Not applicable.

5.2 Preparation. Unless specified by the procuring activity, each Type I container shall be nested when empty and each Type II container shall be in the collapsed configuration for shipment. All component parts of Types I and II containers shall be secured/attached to prevent swinging or loss during shipment.

5.3 Marking for shipment. The container shall be marked for shipment in accordance with MIL-STD-129. The shipment marking shall include the following:

CONTAINER, COLLAPSIBLE, REUSABLE, SHIPPING
AND STORAGE, ASSEMBLED EXTERNAL
AIRCRAFT FUEL TANKS
SPECIFICATION MIL-C-83669A (USAF)

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 containers covered by this specification are intended for domestic and overseas use as shipping and storage containers for assembled external aircraft fuel tanks. The classes for the containers were established by length for the purpose of limiting the variety of containers and for an optimum standardization of parts (see 1.1).

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Type, class and style of the container(s) (see 1.2).
- c. The model number(s) or type(s) of the fuel tanks to be accommodated (see 3.3.2).
- d. The applicable drawing.
- e. The quantity of containers required.
- f. Whether special stacking, stowage, and storage provisions are required (see 3.3.5).
- g. Where the First Article inspection sample should be sent, the activity responsible for inspection. (see 4.4.1).
- h. Materials required if different from those specified in specifications

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or drawings (see 3.2).

1. Special markings (see 3.7)
- j. Tank mounting provisions (see 3.3.2)

6.3 Container classification. The classification presented in 1.2 is designed to be applicable to the majority of tank lengths in use.

6.4 First Article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a production sample, a first article sample, a first production item, a sample selected from the first production items, a standard production item from the contractor's current inventory, and the number of items to be tested as specified in 4.4. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations 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.

6.5 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.

6.6 Subject term (key word) listing.

Container
 Container, external aircraft fuel tanks
 Container fuel tank
 Container, metal
 Container, nestable or collapsible
 Container, shipping and storage
 Container, reusable
 Packaging
 Packaging, container

Custodian:
 Air Force - 69

Preparing Activity:
 Air Force - 69

Review Activities:
 Air Force - 11, 71, 80, 82, 84, 99

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