

INCH-POUND

MIL-DTL-28689C

January 17, 1997

SUPERSEDING

MIL-C-28689B(YD)

21 May 1993

DETAIL SPECIFICATION

CONTAINERS, SHIPPING AND STORAGE, STEEL WALL (WITH AND WITHOUT CABINETY)

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

1. SCOPE

1.1 Scope. This specification covers equipment containers used to store and ship items listed in Naval Construction Force tables of allowance. The containers are of two sizes and either empty for bulk loading of materials or configured with cabinetry to simplify locating parts and equipment for distribution.

1.2 Classification.

1.2.1 Containers. Containers covered by this specification shall be classified by the following type and styles (see 6.2):

- Type I - 8-foot by 8-foot (2 438 mm by 2 438 mm) by 20-foot (6 096 mm) container (ISO Series "1C").
- Type II - 8-foot by 8-foot (2 438 mm by 2 438 mm) by 6-foot 5.5-inch (1 968 mm) container (TRICON).
- Style 1 - Empty container, for loading of large bulk material.
- Style 2 - Container with cabinetry installed.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 1581), Naval Construction Battalion Center, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8145

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MIL-DTL-28689C

1.2.2 Cabinetry. Cabinetry used in style 2 containers shall be of the configuration shown in the drawings (see 3.1.2).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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).

SPECIFICATIONS

FEDERAL

FF-S-2738 - Seals, Antipilferage.

MILITARY

A-A-50271 - Plate, Identification.
 MIL-P-24441/20 - Paint, Epoxy-Polyamide, Green Primer, Formula 150, Type 1.
 MIL-P-24441/22 - Paint, Epoxy-Polyamide, Topcoat, White, Formula 152, Type 1.
 MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.
 MIL-P-53022 - Primer, Epoxy Coating, Corrosion Inhibiting, Lead and Chromate Free.
 MIL-C-53039 - Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant.
 MIL-C-53072 - Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection.

STANDARDS

FEDERAL

FED-STD-595 - Colors Used in Government Procurement.

MIL-DTL-28689C

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

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

DEPARTMENT OF TRANSPORTATION (DoT)

Code of Federal Regulations (CFR), Title 49, Part 450 - Safety Approval of Cargo Containers.
Code of Federal Regulations (CFR), Title 49, Part 451 - Testing and Approval of Containers.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

DRAWINGS

NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

6028532 - NCF Container Wall Configurations - 2A/2B.
6028533 - NCF Container Wall Configurations - 3A/3B.
6028534 - NCF Container Wall Configurations - 4A/4B.
6028535 - NCF Container Wall Configurations - 5A/5B.
6028536 - NCF Container Wall Configurations - D1A/D1B.
6028537 - NCF Container Wall Configurations - D2A/D2B.
6028538 - NCF Container Wall Configurations - D3C.
6139128 - Armory, Air Det (TRICON).
6139129 - Armory, Air Echelon (ISO Series "IC").

(Copies of these drawings are available from Commanding Officer, Naval Construction Battalion Center, Code 1581, 1000 23rd Avenue, Port Hueneme, CA 93043-4301.)

2.3 Non-Government publications. The following other documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

ASTM

ASTM B 633 - Electrodeposited Coatings of Zinc on Iron and Steel.
ASTM B 650 - Electrodeposited Engineering Chromium Coatings on Ferrous Substrates.
ASTM D 746 - Brittleness Temperature of Plastics and Elastomers by Impact.
ASTM D 1640 - Drying, Curing, or Film Formation of Organic Coatings at Room Temperature.

MIL-DTL-28689C

ASTM D 3359 - Measuring Adhesion by Tape Test.

ASTM D 4417 - Field Measurement of Surface Profile of Blast Cleaned Steel.

(Applications for copies should be addressed to the ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1 - Structural Welding Code - Steel.

(Applications for copies should be addressed to the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.)

NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

Rules for the Measurement and Inspection of Hardwood and Cypress Lumber.

(Applications for copies should be addressed to the National Hardwood Lumber Association, P.O. Box 34518, Memphis, TN 38134.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 668 - Series 1 Freight Containers - Classification, Dimensions and Ratings.

ISO 1161 - Series 1 Freight Containers - Corner Fittings.

ISO 1496-1 - Series 1 Freight Containers - Specification and Testing - Part I: General Cargo Containers for General Purposes.

ISO 6346 - Freight Containers - Coding, Identification and Marking.

(Applications for copies should be addressed to the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.)

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC-SP 10 - Joint Surface Preparation Standard for Near-White Blast Cleaning.

SSPC-PA 1 - Shop, Field, and Maintenance Painting.

SSPC-PA 2 - Measurement of Dry Paint Thickness with Magnetic Gages.

SSPC-VIS 1 - Visual Standard for Abrasive Blast Cleaned Steel.

(Applications for copies should be addressed to the Steel Structures Painting Council, 4516 Henry Street, Suite 301, Pittsburgh, PA 15213-3728.)

2.4 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.

MIL-DTL-28689C

3. REQUIREMENTS

3.1 Description. Containers covered by this specification shall be of the type and style specified in the contract. The term "cabinetry" as used in this specification, shall refer to cabinets with drawers or shelves.

3.1.1 Containers. The containers shall be closed-van general-purpose freight containers, as defined in ISO 668. Three type II containers coupled end-to-end, using captive connecting couplers described in 3.4.13, shall form an integral 20-foot (6 096 mm) module dimensionally equivalent to the type I container. Each container shall have a current Convention for Safe Containers (CSC) certification issued by an "approved authority" designated as such by the United States Coast Guard in accordance with 49 CFR 450, subpart B. CSC certification tests for type II containers shall be performed on three coupled containers in the 1C configuration. Definition of container terminology and classification shall conform to ISO 668.

3.1.2 Cabinets. The cabinets shall consist of a housing containing a combination of drawers or shelves in various configurations as shown in NAVFAC Drawings Nos. 6028532, 6028533, 6028534, 6028535, 6028536, 6028537, 6028538, 6139128, and 6139129. Configuration number identified with an "A" suffix is installed on the right side of the container as viewed from the container entrance. A "B" suffix indicates the configuration mounted on the left side of the container. The configuration with a "C" suffix is designed to be installed against the end wall of a type II container. Cabinet design shall make maximum use of available space inside container within the constraints established by this specification. The cabinetry, excluding weapons storage racks, shall be provided by a single manufacturer to insure modularity and interchangeability of parts.

3.2 First article. The supplier shall furnish the number of containers and of the type, style, and configuration as specified in 6.2 for first article examination and test, to prove that his production methods will produce finished containers that comply with the requirements of this specification. Examination and test shall be those specified herein and shall be subjected to surveillance and approval by the Government.

3.3 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

MIL-DTL-28689C

3.3.1 Dissimilar metals. Intimate contact of dissimilar metals which can be expected to cause galvanic corrosion shall be avoided. When such contact cannot be avoided, an interposing insulating material shall be provided to minimize the corrosive effect.

3.4 Container construction. All containers shall be new and unused. Each container shall be constructed on a steel frame with bottom crossmembers, steel corrugated walls, steel corrugated roof, metal doors, and ISO corner fittings at all corners. Containers shall be constructed so as to be free of any recesses and voids in which contraband can be concealed or where moisture can accumulate. No part of the container shall protrude beyond the outside surfaces of the corner fittings. Caulking shall not be used on any interior or exterior container surface. Containers shall be designed and constructed to withstand the static and dynamic loads induced by the tests specified in 4.5. All containers shall be designed and constructed to be weatherproof. Any water leakage, either during the simulated rainfall test of 4.5.4 or during actual rain conditions, will be considered evidence that the container is not weatherproof.

3.4.1 Weight. Container weight limits shall be as given in table I. Actual tare weight in pounds (lbs) (kilograms (kg)) of style 2 containers shall be the sum of the weight of the empty container plus the weight of installed cabinetry.

TABLE I. Container weight limits.

Container	Maximum Tare Weight Without Cabinetry	Maximum Gross Rating
Type I	5,000 lbs (2 268 kg)	44,800 lbs (20 321 kg)
Type II	2,700 lbs (1 225 kg)	14,900 lbs (6 759 kg)

3.4.2 Dimensions. The minimum internal dimensions and actual external dimensions and tolerances shall be in accordance with ISO 668, as modified in table II.

TABLE II. Dimensions.

Container	Height (inches) (mm)	Width (inches) (mm)	Length (inches) (mm)
Type I Interior	87 (2 210) min.	91 3/4 (2 230) min.	231 (5 867) min.
Type I Exterior	96 + 0, -3/16 (2 438 + 0, -5)	96 + 0, -3/16 (2 438 + 0, -5)	238 1/2 + 0, -1/4 (6 058 + 0, -5)
Type II Interior	86 1/2 (2 197) min.	90 1/2 (2 299) min.	73 (1 854) min.
Type II Exterior	96 + 0, -3/16 (2 438 + 0, -5)	96 + 0, -3/16 (2 438 + 0, -5)	77 1/2 + 0, -3/16 (1 968 + 0, -5)

3.4.3 Scuff boards. The interior of the front end wall, opposite the doors, of type I, style 1 containers shall have scuff boards installed. The scuff boards shall be nominal 0.75-inch (19 mm) by 12-inch (305 mm) by length of the wall of class A vehicle grade apitong conforming to the requirements of the NHLA Rules for the Measurement and Inspection of Hardwood and Cypress Lumber or of comparable size and gage of galvanized steel beam guard rail. The lower edge of the scuff board shall be 2.5 ± 0.5 -inch (63 ± 13 mm) above the bottom

MIL-DTL-28689C

frame rail. Fasteners shall be located at intervals adequate to hold the scuff boards securely in place. Fasteners shall not penetrate the outside wall of the container. The scuff boards shall not be installed until all interior material surfaces have been cleaned, and painted as specified in 3.8 and 3.8.1.

3.4.4 Floor construction. The floor shall be of solid hardwood boards. The boards shall run longitudinally except that the width of the longitudinal edge boards may be different, if required. When the widths of both longitudinal edge boards differ from the intermediate plank width, they shall be of the same width as each other. The board edges shall be jointed by shiplap construction. The boards shall be attached to the crossmembers by means of not less than three fasteners per board, per crossmembers, for boards over 7 inches (178 mm) wide, and two fasteners per board, per crossmembers, for boards less than 7 inches (178 mm) wide. Countersunk head fasteners, not less than 0.25-inch (6 mm) diameter, either of the self-tapping screw type, or machine screw with self-locking nuts, shall be installed so that each head is 0 to 0.0625-inch (0 to 1.6 mm) below the board surface and at least 1-inch (25 mm) from the board edge. The floor shall be installed to permit lateral variations in floorboard width due to swelling.

3.4.5 Understructure. Container bottom side rails and bottom end frame members shall not deflect more than 0.25-inch (6 mm) below the bottom plane of the bottom corner fittings when the container is tested as specified in 4.5. Crossmembers shall not deflect below the bottom plane of the bottom corner fitting when the container is tested as specified in 4.5. All cross-members shall be of the same configuration and strength and shall have a center-to-center distance of not greater than 12 inches (305 mm), except where the 14-inch (356 mm) wide forklift pockets are located on the type 1 containers.

3.4.5.1 Forklift pockets. Each container shall have collared design forklift pockets. Type I containers shall have two sets of forklift pockets. The first set of forklift pockets shall be not less than 14 inches (356 mm) wide by not less than 4.5 inches (114 mm) high; spacing for forklift pockets shall be 81 ± 2 inches (2057 ± 51 mm), center-to-center of the forklift pockets. The second set of forklift pockets shall be not less than 12 inches (305 mm) wide by not less than 4 inches (101 mm) high; spacing for forklift pockets shall be 35.5 ± 2 inches (902 ± 51 mm), center-to-center of the forklift pockets. Type II containers shall have lift entry from both sides and from the closed end of the container; the forklift pockets shall be not less than 12 inches (305 mm) wide by not less than 4 inches (102 mm) high; spacing for forklift pockets shall be 35.5 ± 2 inches (902 ± 51 mm), center-to-center of the forklift pockets. All forklift pockets shall be in accordance with ISO 1496-1, Annex C. Type I containers shall be clearly marked "USE 8-FOOT TINES ONLY" and "INNER FORKLIFT POCKETS ARE FOR HANDLING UNLOADED CONTAINERS ONLY." Letters shall be 2 inches (51 mm) high.

3.4.6 Roof construction. The roof shall be self-draining, and of corrugated construction. If roof bows are fastened to the roof sheet, they shall be bonded by a suitable bonding agent. In the case of roof bows that are not fastened to the roof sheet, antichafing material shall be affixed to the roof bows on the surfaces facing the roof sheets. The roof sheet, roof rails, and upper end frame members shall be not less than 0.25-inch (6 mm) below the top plane of the top corner fittings.

MIL-DTL-28689C

3.4.7 Doors. Door openings shall conform to ISO 1496-1. Doors in type II containers shall be hung in the nominal 6-foot 8-inch (2 032 mm) wide container frame to provide a clear interior opening of not less than 84 inches (2 134 mm) high and 70-3/4 inches (1 797 mm) wide. Four heavy-duty pin hinges per door, equally spaced, recessed within the corner structure shall be provided on each door allowing the door to fold back against the sides of the body. Steel hinges shall include nylatron bushings to permit smooth door operation. Means shall be provided to hold the doors in the full open position. Each door shall have two or more heavy-duty, hand operated, cam locking handles with anti-rack provisions. Handles shall be between 12 inches (305 mm) and 18 inches (457 mm) above the bottom plane of the corner fittings. All locking device handles shall be furnished with provisions for padlocking and customs sealing.

3.4.7.1 Door gasket. The door weather seal gaskets shall be ethylene propylene with diene monomer (EPDM) synthetic rubber extruded shape with flexible double type flanges. The EPDM material must meet or exceed the low temperature brittleness test of ASTM D 746 to -40 degrees Fahrenheit (°F) (-40 degrees Celsius (°C)). The gaskets shall be provided around the entire periphery of each door, except for the vertical right side of the left hand door. The left hand door shall be designed to mate with the right hand door gasket. The right hand door shall open first and close last. The major seal flange shall perform as an internal gasket on the frame. Both seal flanges shall be shaped to yield firmer seats with increasing positive external pressure. The corners of the gaskets shall be mitered at 45 degrees and heat bonded into one (1) continuous section. Mechanical fasteners shall be used to attach the gasket material to the door. The doors, when closed, shall form a weatherproof seal. Door gaskets shall be black.

3.4.8 Corner fittings. Type I containers shall be constructed with top and bottom corner fittings conforming to ISO 1161. Bottom corner fittings conforming to ISO 1161 will be installed on both top and bottom corner fitting locations of Type II containers.

3.4.9 Antipilferage provisions. Hinge-pins and screws, bolts, and other fasteners used for securing the hinges and closing devices to the container and for holding the essential parts of the sides, ends, and roof. Fasteners shall be tack welded or otherwise secured in such a manner as to prevent access to the interior of the container without leaving visible signs of tampering. Where such welding destroys the protective coating on the items being welded or on other container parts, the weld and surrounding area shall be thoroughly cleaned, treated, and painted in accordance with 3.8. All locking device handles shall be furnished with provisions for padlocking and customs sealing.

3.4.10 Bulk load restraint system. A barrier type restraint system for bulk loaded material shall be designed into the door frame of all containers. The system shall provide for positioning three horizontal 2-inch by 6-inch (51 mm by 152 mm) beams at nominal 2 feet (610 mm), 4 feet (1 219 mm), and 6 feet (1 829 mm) above the floor. In style 2 containers, when there is insufficient clearance between the cabinetry and the front corner post, the barrier restraint system is not required.

3.4.11 Tie-down eyes. Tie-down eyes shall be installed in the style 1 container and on the empty or partially empty wall in the style 2 container. Tie-down eyes shall be welded to the interior of

MIL-DTL-28689C

the container on the base frame and roof frame, set into the recess of wall corrugations. In type I containers, seven eyes shall be evenly spaced approximately 45 inches (1 143 mm) apart along each side wall base and roof frame. One tie-down eye shall be mounted at the center of the end wall base frame; this arrangement shall be duplicated on the end wall roof frame. In type II containers, five eyes shall be spaced approximately 24 inches (610 mm) apart along each side wall and one mounted at the center of the end wall. This arrangement applies to both the bottom and top frames. All tie-down eyes shall be rated at not less than 4,000 pounds (1 814 kg).

3.4.12 Tie-down rods. Tie-down rods shall be 0.625-inch (16 mm) smooth rod. Each rod shall be of one piece for the full length of the wall. Rods shall be welded horizontally to all the interior walls of style 1 containers and on the empty wall space, not covered by cabinetry in style 2 containers. Rods shall be located at 6 ± 0.25 inches (152 ± 6 mm), 24 ± 0.25 inches (610 ± 6 mm), 48 ± 0.25 inches ($1\ 219 \pm 6$ mm), and 72 ± 0.25 inches ($1\ 829 \pm 6$ mm), above the base frame. On end walls which have scuff boards, the rods shall be welded at 24 ± 0.25 inches (610 ± 6 mm), 48 ± 0.25 inches ($1\ 219 \pm 6$ mm), and 72 ± 0.25 inches ($1\ 829 \pm 6$ mm) above the base frame. Rebar is not allowed.

3.4.13 Captive connecting couplers. Each type II container shall be provided with three captive connecting couplers conforming to NSN 5410-01-363-7086. Suitable storage space for these couplers shall be provided in the container. Location of storage space shall be in such a manner that it will not interfere with drawer or cabinet door use with or without captive connecting couplers installed.

3.4.14 Power supply cord port. Each container shall have a power supply cord port. The power supply port shall be located approximately at the midpoint of the end wall, except in the TRICON armory and D3C configurations. Port for the TRICON armory and D3C configurations shall be located on right wall, looking into the container, approximately 24 inches (610 mm) below the header and 24 inches (610 mm) from the corner post. Power supply cord port shall be located in such a manner that it will not interfere with or be covered by the cabinets, rifle racks, or cabinet doors. Power supply cord port shall consist of a 2-inch (51 mm) inside diameter pipe nipple, inserted into an appropriately sized hole through and welded to the crest of the corrugation of the end wall. The exterior pipe end shall not protrude beyond the container envelope. The interior pipe end shall not protrude beyond highest point of corrugation on the interior of the wall. An internal feller plug shall be provided to make a weatherproof seal. The feller plug, when installed, shall not protrude beyond the tie-down rod. The plug shall also be capable of being installed or removed without use of tools.

3.4.15 Container vents. All type I and type II containers shall have passive venting system. The venting system shall dissipate condensed moisture within the container during field operations. The venting system shall be similar to commonly used venting systems in commercial ISO containers. A vent cover shall be an integral part of the vent. The vents shall be capable of being opened and closed from the outside without use of tools. Two vents shall be located in each side wall, at opposite end of the containers. Vents shall be located as close to the top of the wall as practical. The venting system shall not violate ISO envelope requirements, nor shall the vents protrude into the interior beyond the protective tie-bar system. The vents, when open, shall not

MIL-DTL-28689C

permit wind driven rain or splash to enter the container. The vent, when closed, shall form a tight seal. The gasket material shall be mechanically fastened to the vent. Gasket material shall not be painted.

3.5 Cabinet construction. The cabinets shall be designed and constructed to withstand the static and dynamic loads induced by the tests specified in 4.5.

3.5.1 Cabinet housing. The cabinet housing shall be of frame reinforced sheet metal construction, shall have a depth of 22 ± 1 inches (559 ± 25 mm), or 27.5 ± 1 inches (699 ± 25 mm), as shown on the applicable drawing, but shall be no greater than that which will allow an aisle between the two rows of cabinetry of not less than 27 inches (686 mm) between cabinets in type II (TRICON) containers and 30 inches (762 mm) wide in the type I (STD 20) containers. Cabinet housings shall be 28 to 30 inches (711 to 762 mm), 42 to 47 inches (1 067 to 1 194 mm) or 56 to 60 inches (1 422 to 1 524 mm) in width (herein identified as 30 inches (762 mm) wide, 45 inches (1 143 mm) wide, and 60 inches (1 524 mm) wide respectively). Shelf and drawer installation method shall be so designed as to aid flexibility in arrangement. To accomplish this, the mounting system for shelves and drawers shall be adjustable in increments of not greater than 1.5-inch (38 mm) to allow raising or lowering of the shelves and drawers.

3.5.2 Drawers. Drawers shall be of a design which allows installation of partitions and dividers and makes possible a wide range of subdivisions to accommodate small parts. Compartments as small as 2-inch by 2-inch (51 mm by 51 mm) shall be attainable. Drawers shall be capable of being open fully to allow full visibility of the contents. Side wall height shall be not less than 70 percent of usable height of drawer.

3.5.2.1 Working load. The static working load per drawer shall be not less than 400 pounds (181 kg). The drawers shall also be capable of withstanding the dynamic loading induced by the testing specified in 4.5.3.1 thru 4.5.3.3 when loaded as specified in 4.5.3.

3.5.2.2 Suspension system. Drawers shall have a suspension system of metal construction with ball or roller bearings which will allow smooth movement, even when the drawers are loaded to their 400 pounds (181 kg) capacity.

3.5.2.3 Lock-in, lock-out. All drawers shall have individual lock-in lock-out (LILO) latches which lock drawers in closed or fully extended position. The LILO latches shall be engineered chrome (with a thickness of not less than 2.0 mils (0.051 mm) as specified in ASTM B 650) or stainless steel or electrodeposited zinc coating (with a thickness of not less than 0.5 mils (0.013 mm), as specified in ASTM B 633).

3.5.2.4 Drawer partitions. Each drawer shall be provided with partitions and dividers as specified in table III. Installation of the partitions shall utilize machine screws and self-locking nuts to fasten the partitions to the drawer bottom. The height of the partitions and dividers shall be such that the tops of all partitions and dividers fall within 0.25-inch (6 mm) of the top of the drawer side walls, but not extend above any side wall.

MIL-DTL-28689C

TABLE III. Drawer partition and dividers required per drawer.

Drawer Size WxDxH (in mm)	Nominal Width of Divider (in inches)					Partitions Side-side mounting
	2.625 (67 mm)	3.625 (92 mm)	5.75 (146 mm)	7.875 (200 mm)	12.125 (308 mm)	
30x27x2 (762x686x51)	2	4	4	2	1	4
30x27x4 (762x686x102)	1	4	2	2	1	3
30x27x6 (762x686x152)		3	2	2	1	3
30x27x7 (762x686x178)		2	2	2	2	3
30x27x8 (762x686x203)		1	2	4	1	3
30x27x10 (762x686x254)		2	2	2	2	3
30x27x11 (762x686x279)		1	2	3	1	3
30x27x13 (762x686x330)		1	2	3	1	3
45x27x2 (1,143x686x51)	5	8	6	5	4	5
45x27x6 (1,143x686x152)		4	6	4	2	3
45x27x10 (1,143x686x254)		1	3	3	2	3
45x27x11 (1,143x686x279)		1	3	3	2	3
45x27x13 (1,143x686x330)		1	3	3	2	2
60x27x2 (1,524x686x51)	4	4	3	3	1	4
60x27x10 (1,524x686x254)		1	3	2	1	3
60x27x11 (1,524x686x279)		1	3	2	1	3
60x27x13 (1,524x686x330)		1	3	2	1	3
30x22x2 (762x559x51)	3	4	3	2	1	4
30x22x4 (762x559x102)	1	4	4	1	1	3
30x22x6 (762x559x152)		3	3	1	1	2
30x22x8 (762x559x203)		1	1	2	1	2
30x22x11 (762x559x279)		1	1	2	1	2
30x22x13 (762x559x330)		1	1	2	1	2

NOTE: "H" indicates usable height within the drawer. "D" indicates cabinet depth, and "W" (30, 45, 60) indicates compatibility with cabinet width (see 3.5.1)

MIL-DTL-28689C

TABLE IIIa. Drawer per wall configuration.

Drawer Size W x D x H (in mm)	Nominal Width of Divider (in inches)				TRICON ARMORY	Partitions	
	2A or 2B	4A or 4B	5A or 5B	STD 20 ARMORY		D2A or D2B	D3C
30x27x2 (762x686x51)	4	6	2				2
30x27x4 (762x686x102)	7	10	1	1			
30x27x6 (762x686x152)	4		2	2			1
30x27x7 (762x686x178)				1			
30x27x8 (762x686x203)	2	2					
30x27x10 (762x686x254)							1
30x27x11 (762x686x279)	1	6	2				
30x27x13 (762x686x330)	4	12	8				1
45x27x2 (1,143x686x51)							2
45x27x6 (1,143x686x152)							1
45x27x10 (1,143x686x254)							1
45x27x11 (1,143x686x279)	1						
45x27x13 (1,143x686x330)	3					1	
60x27x2 (1,524x686x51)				1			
60x27x10 (1,524x686x254)				1			
60x27x11 (1,524x686x279)				2	1		
60x27x13 (1,524x686x330)				5	3		
30x22x2 (762x559x51)						8	
30x22x4 (762x559x102)						5	
30x22x6 (762x559x152)						6	
30x22x8 (762x559x203)						2	
30x22x11 (762x559x279)						2	
30x22x13 (762x559x330)						2	

MIL-DTL-28689C

3.5.2.5 Partition and divider installation. Partitions and dividers shall not be installed in the drawers, but shall be packaged with all necessary screws and nuts in groups broken down by drawer heights for all cabinets within a container. These groups shall be clearly marked and shipped in a separate box within the cabinetry configured containers.

3.5.2.6 Drawer covers. In cabinets having drawers of approximately 2 inches (51 mm) usable height, the top two drawers shall be provided with a rigid clear plastic cover to prevent small parts from bouncing out of their designated compartments during container handling and transport. The covers shall be provided with a means of securing them in the closed position.

3.5.2.7 Handles. Drawer handles shall run the full length of the drawer front, and shall have no sharp edges or protrusions. Handles shall be recessed and shall not extend beyond the front of the cabinet housing. Each handle shall have a snap-on label holder to identify the location address of the drawer.

3.5.2.8 Interchangeability. Drawers of the same dimensions shall be interchangeable with one another.

3.5.3 Shelves. Slotted shelves shall be provided as required in the drawings. A method of attaching the shelves that prevent the shelves from vibrating loose from the cabinet housing during container handling and transport shall be provided. All shelves shall be provided with doors as described in 3.5.4 and 3.5.5.

3.5.3.1 Shelf tie-down straps. Adequate tie-down straps or other restraining devices shall be provided for each shelf shown in the cabinetry configuration drawings.

3.5.4 Retractable overhead doors. Where mounting is possible, shelves shall be provided with retractable overhead doors. Each retractable door shall have a positive latching mechanism which will secure the door in the fully closed position.

3.5.5 Hinged swinging doors. Shelf combinations with a height exceeding that which can be covered by a retractable overhead door, shall be provided with hinged swinging doors, hinged at the outer edge of the cabinet opening. Double doors shall be used on 45-inch (1 143 mm) wide cabinets. Each individual door shall have a positive latching mechanism which will secure the door in the fully closed position.

3.5.6 Locking bars. All drawers and doors shall be provided with full-length vertical hinged bar locks. Each bar lock shall be capable of securing the drawers for the entire cabinet to which it is mounted. Retractable doors shall be provided with hinged locking bars on both sides of the opening. Double doors shall have a single vertical locking bar which will secure both doors at the same time.

3.6 Weapons storage racks. The weapons storage racks installed in the armory configuration shown in NAVFAC Drawing nos. 6139128 and 6139129 shall conform to NSN 1095-00-407-0674.

MIL-DTL-28689C

3.7 Cabinetry installation. Cabinetry installation shall be performed in a manner which will ensure secure storage of all equipment and parts for which the containers are intended. As a minimum, the requirements of 3.7.1 shall be met. Additional provisions required for secure mounting of cabinetry, which are not specified herein, but are determined by the manufacturer to be necessary, shall be included.

3.7.1 Cabinetry mounting. Cabinetry base mount shall extend the full length of the cabinetry and shall be of sufficient size and strength to withstand the loads imposed by handling when cabinets are fully loaded. The base mount shall be secured to the base of the cabinet and to the floor. Securing the base mount to the floor shall not protrude into the forklift tineways. Cabinet mounting bolts shall not penetrate sheet metal walls of the container. Overhead crossmembers (horizontal struts) shall be securely attached to cabinetry on both sides of the aisle at the top of each cabinet. Cabinetry shall be mounted in such a manner that it does not interfere with the restraint system specified in 3.4.10.

3.7.2 Fasteners. All fasteners used in cabinetry installation shall be cadmium plated and shall be of the self-locking type.

3.8 Cleaning and painting. Container and cabinetry surfaces shall be shop-prepared and shop-painted, in accordance with SSPC-SP 10, SSPC-PA 1, and as specified herein. The surface profile, as measured by ASTM D 4417, shall be 1 to 1.5 mils (0.025 to 0.038 mm) for interior surfaces and cabinetry, and not greater than 1 mil (0.025 mm) for exterior surfaces and other surfaces specified in 3.8.2. The appearance of the surfaces shall be similar to SSPC-VIS 1 photograph A SP-10, and the condition of the surfaces shall pass the "water-break" test of MIL-C-53072, 4.3.3.1. The surfaces shall comply with the specified degree of cleaning, and shall be dry, immediately prior to application of primers. The total paint films shall pass the thickness, adhesion, and cure tests as specified, and shall be free from runs, sags, orange peel, and other defects. Door seals shall not be painted.

3.8.1 Interior painting. Painting of container interior surfaces, except as noted in 3.8.2, shall consist of not less than one coat of primer and one finish coat. The primer shall conform to formula 150, type 1, of MIL-P-24441/20, and shall be applied to the specified clean, dry surface immediately after cleaning. The dry film thickness of the primer shall be not less than 3.0 mils (0.076 mm) over the entire surface. Paint for the finish coat shall conform to formula 152, type 1, of MIL-P-24441/22, applied to a dry film thickness of not less than 3.0 mils (0.076 mm) over the entire surface. The total dry film thickness shall be not less than 6.0 mils (0.152 mm), as measured by SSPC-PA 2, and the film shall pass the dry-through test of ASTM D 1640, and the adhesion test of ASTM D 3359, rating 3A. Cabinetry finish shall be as specified in 3.8.3. The scuff boards shall be treated and painted in accordance with the manufacturer's standard practice.

3.8.2 Exterior painting. Painting of container exterior surfaces, interior of the doors, header, and door posts shall consist of not less than one coat of primer and not less than two finish coats. The primer shall conform to MIL-P-53022, and shall be applied to the specified clean, dry surface immediately after cleaning. The dry film thickness of the primer shall be not less than 1.5 mils (0.038 mm) over the entire surface. Paint for the finish coat shall be Green 383, conforming to

MIL-DTL-28689C

either MIL-C-53039 or type IV of MIL-C-46168. Before application of the finish coat, spectral reflectance characteristics of the material shall be validated as specified in paragraph 4.2.4 of the specification selected. The dry film thickness of each applied coat shall be not less than 1.8 mils (0.046 mm). The dry film thickness of the finish coat shall be not less than 3.6 mils (0.091 mm) over the entire surface. The total dry film thickness shall be not less than 5.1 mils (0.13 mm), as measured by SSPC-PA 2, and the film shall pass the adhesion test of ASTM D 3359, rating 3A. The cured coating shall pass the dry-through test of ASTM D 1640, and the solvent wipe test of MIL-C-53072, 4.3.3.2.

3.8.3 Cabinetry painting. Painting of cabinetry surfaces shall consist of not less than one coat of primer and one finish coat. The primer shall conform to formula 150, type 1, of MIL-P-24441/20, and shall be applied to the specified clean, dry surface immediately after cleaning. The dry film thickness of the primer shall be not less than 2.0 mils (0.051 mm) over the entire surface. Paint for the finish coat shall conform to formula 152, type 1, of MIL-P-24441/22, applied to a dry film thickness of not less than 2.0 mils (0.051 mm) over the entire surface. The total dry film thickness shall be not less than 4.0 mils (0.102 mm), as measured by SSPC-PA 2, and the film shall pass the dry-through test of ASTM D 1640, and the adhesion test of ASTM D 3359, rating 3A.

3.8.4 Cabinetry hardware. All cabinetry hardware that is not painted shall be engineered chrome (with a thickness of not less than 2.0 mils (0.051 mm) as specified in ASTM B 650) or stainless steel or electrodeposited zinc coating (with a thickness of not less than 0.5 mils (0.013 mm), as specified in ASTM B 633).

3.9 Identification marking. All letters shall be Gothic or Futura capitals with Arabic numerals and shall read from left to right. The stenciling medium shall be white color 37875 of FED-STD-595, conforming to MIL-C-46168. Stenciling medium shall not rub off of the exterior surface of the container when the medium is dry.

3.9.1 Exterior marking. All containers shall be marked as specified herein. The following information shall be stenciled on the right hand door in 2-inch (51 mm) letters and numerals in accordance to ISO Standards: Tare weight (see 3.4.1), maximum gross rating, air shipment maximum operating weight (type I - 25,000 pounds (11 340 kg), type II - 10,000 pounds (4 536 kg)), shipping cube, and nominal outside dimensions.

3.9.1.1 Data plates. A nonferrous metal data plate conforming to A-A-50271, shall be affixed to the center of the external surface of the right hand door. The method of attachment shall be either riveting or bolting. The data plate shall contain the following information (NSNs shall be provided by the contracting officer):

MIL-DTL-28689C

U. S. NAVY

CONTAINER, SHIPPING AND STORAGE, STEEL WALL (SPECIFY TYPE AND STYLE)

SPECIFICATION: MIL-DTL-28689(YD)

NSN: _____

ISO CONTAINER CONTROL NUMBER: _____

TARE WEIGHT: LBS _____ KG _____

CONTRACT NUMBER: _____

MFD BY: _____

DATE (MONTH & YEAR): _____

3.9.1.2 ISO container control number. The ISO container control number (ICCN) consists of eleven characters: four letters for the owners code, a six-digit serial number, and a check digit. The ICCN shall be 4 inches (102 mm) high, located in accordance with ISO 6346. The stenciling medium shall be as specified in 3.9. The ICCNs shall be provided by the contracting officer.

3.9.1.3 CSC plates. A Convention for Safe Containers (CSC) safety approval plate conforming to 49 CFR 451, subpart C, with the appropriate information stamped, etched, or engraved on it shall be riveted or bolted to the lower left corner of the exterior face of the left hand door of each container.

3.9.2 Interior marking. The ICCN shall be stamped or welded in characters not less than 0.5-inch (13 mm) high on an interior surface of the upper rear horizontal frame member. The number shall be located where it will not be obscured.

3.10 Workmanship. All parts, components, and assemblies of the container including castings, forgings, molded parts, stampings, seals and sealing agents, machined surfaces, and welded parts shall be clean and free from any defects that will reduce the capability of the container to meet the requirements specified herein. Any components and assemblies which have been repaired or modified to overcome deficiencies shall not be used without prior specific approval of the contracting officer. External surfaces shall be free from burrs, slag, sharp edges, and corners except where sharp edges and corners are required. The internal cargo space shall be free from sharp protrusions that could damage cargo.

3.10.1 Metal fabrication. Metal used in the fabrication of equipment shall be free from kinks and sharp bends. The straightening of material shall be done by methods that will not cause injury to the metal. Shearing and clipping shall be done neatly and accurately. Corners shall be square and true. Flame cutting, using a tip suitable for the thickness of the metal, may be employed instead of shearing or sawing. Burned surfaces of flame-cut material shall be free of slag. All bends of a major character shall be made with controlled means in order to insure uniformity of size and shape. Precautions shall be taken to avoid overheating, and heated metal shall be allowed to cool slowly.

3.10.2 Bolted and riveted connections. Bolt and rivet holes shall be accurately punched or drilled and shall have the burrs removed. Washers, lockwashers, or lock nuts shall be provided where

MIL-DTL-28689C

necessary and all bolts, nuts, and screws shall be tight. Rivet heads, when not countersunk or flattened, shall be of uniform size and shape for the same diameter of rivet, concentric with the rivet holes, and in full contact with the surface of the members.

3.10.3 Welders and welding.

3.10.3.1 Welders. Before assigning any welder to manual welding work covered by this specification, the contractor shall provide the contracting officer with certification that the welder assigned to perform welding responsibilities covered by this specification has passed qualification test prescribed by AWS D1.1, Section 5, for the type of welding operations to be performed and that such qualifications are effective as defined by the code.

3.10.3.2 Welding. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. All weld spatter and projections on mating surfaces where members are in contact for fabrication or assembly shall be ground to a suitable flat surface. Weld penetration shall be such as to provide transference of maximum design stress through the base metal juncture. Fillet welds shall be provided when necessary to reduce stress concentration. Manual and machine welding processes and materials shall be in accordance with AWS D1.1.

3.10.4 Machine work. All parts shall be manufactured to gage through the use of jigs and fixtures and shall provide interchangeability of parts as manufactured.

3.10.5 Castings. Castings shall be sound and free from patching, misplaced coring, warping, or defects which might render the castings unsound for use.

3.11 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract, 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 document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document 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

MIL-DTL-28689C

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.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on the containers listed in 3.2 when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.4 and the tests of 4.5.2 thru 4.5.4. The tests of 4.5.3 shall be performed on three type II, style 1 containers coupled in the equivalent of an ISO series 1C configuration. The first article test shall be performed by the contractor under the direction and in the presence of Government representatives. Failure to pass any of the required tests shall be cause for the Government to refuse acceptance of all containers until corrective action has been taken. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of this specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract. In the event the contractor desires to deliver the test model as a contract item, it shall be delivered as the last item on the contract only after the contractor, at his own cost and expense, shall have completely cleaned, reconditioned, and overhauled the unit, making such replacements and modifications thereto as are required to make the unit acceptable as a contract item. Acceptance of first article shall not constitute a waiver by the Government of its rights under provisions of the contract.

4.2.1.1 CSC certification. A copy of test reports documenting the results of container certification testing, conducted in accordance with 4.5.1, shall be made available for Government inspection prior to the first article inspection.

4.2.1.2 Standards compliance. The contractor shall make available to the contracting officer or his authorized representative evidence of compliance with the applicable standards cited in this specification.

4.2.2 Quality conformance inspection. The quality conformance inspection shall be performed on items selected in accordance with 4.3 and shall consist of the examination of 4.4.

4.3 Inspection. All containers offered for delivery at one time shall be inspected for conformance to all contract requirements. If a container is rejected, the contractor may rework it to correct the defects, and resubmit for a complete reinspection. Resubmitted containers shall be reinspected using tightened inspection. If the rejected container was screened, reinspection shall be limited to

MIL-DTL-28689C

the defect causing rejection. Rejected containers shall be separate from new containers, and shall be clearly identified as reinspected containers.

4.4 Examination. The first article, and each container selected thereafter in accordance with 4.3, shall be examined for compliance with the requirements specified in section 3 and table IV of this specification.

TABLE IV. Classification of defects.

Classification	Defects	Requirement Paragraph
Major:		
101	Materials not as specified.	3.3
102	Container construction not as specified.	3.4
103	Weight not as specified.	3.4.1
104	Dimensions not as specified.	3.4.2
105	Floor construction not as specified.	3.4.4
106	Understructure not as specified.	3.4.5
107	Forklift pockets not as specified.	3.4.5.1
108	Roof construction not as specified.	3.4.6
109	Doors not constructed as specified.	3.4.7
110	Door gasket not as specified.	3.4.7.1
111	Corner fittings not as specified.	3.4.8
112	Antipilferage provisions not as specified.	3.4.9
113	Restraint system not as specified.	3.4.10
114	Tie-down eyes not as specified.	3.4.11
115	Tie-down rods not as specified.	3.4.12
116	Captive couplers not as specified.	3.4.13
117	Power supply cord port not as specified.	3.4.14
118	Container vents not as specified.	3.4.15
119	* Housing not as specified.	3.5.1
120	* Drawers not as specified.	3.5.2
121	* Drawer working load not as specified.	3.5.2.1
122	* Suspension system not as specified.	3.5.2.2
123	* Lock-in lock-out system not as specified.	3.5.2.3
124	* Drawer partitions not as specified.	3.5.2.4
125	* Insufficient number of drawer partitions and dividers.	3.5.2.4.1
126	* Drawer covers not as specified.	3.5.2.5
127	* Handles not as specified.	3.5.2.6
128	* Drawers not interchangeable.	3.5.2.7
129	* Shelves not as specified.	3.5.3
130	* Doors not as specified.	3.5.4, 3.5.5
131	* Locking bars not as specified.	3.5.6

MIL-DTL-28689C

TABLE IV. Classification of defects. - Continued

Classification	Defects	Requirement Paragraph
132	Storage racks not as specified.	3.6
133	* Cabinetry mounting not as specified.	3.7.1
134	Fasteners not as specified.	3.7.2
135	Cleaning/painting not as specified.	3.8 thru 3.8.3
136	Paint material not as specified.	3.8.1 thru 3.8.3
137	Paint thickness, adhesion, or cure not as specified.	3.8.1 thru 3.8.3
138	Workmanship not as specified.	3.10
139	Parts not interchangeable as specified.	3.11
Minor:		
201	* Tie-down straps missing.	3.5.3.1
202	Fasteners not as specified.	3.7.2
203	Identification marking not as specified.	3.9
204	Exterior marking not as specified.	3.9.1
205	Data plates not as specified.	3.9.1.1
206	ISO control number not as specified.	3.9.1.2
207	CSC plate not as specified.	3.9.1.3
208	Interior marking not as specified.	3.9.2

(NOTE: Asterisks (*) indicate items which apply to style 2 containers only).

Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements.

Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4.1 Examination for floor flatness. Examination for floor flatness shall be performed on one complete container of each 10 containers presented for delivery. The container floor flatness shall be measured using a 3-foot (914 mm) straightedge with a out-of-trueness of not greater than + 0.003 inch/foot (0.025cm/m) and rigid enough so that it does not bend in the measurement plane, and a steel 12-inch (305 mm) rule, graduated to 0.03125-inch (0.79 mm) or finer. Lay the straightedge on its edge on the floor of the container. With the steel rule, measure the distance between the straightedge and the floor surface to the nearest 0.03125-inch (0.79 mm), at the point of greatest deviation. Measurement shall be taken in no less than five different locations on the container floor. Measuring points shall be not less than 3 feet (914 mm) apart. Floor flatness shall conform to the requirements of 3.4.4.

4.5 Tests. The following tests shall be performed to verify compliance with 3.4 and 3.5. Container doors shall be sealed with a type 1, 2, or 3 security seal conforming to FF-S-2738 prior to the beginning of each test. At the completion of each test, door seals shall be removed and doors opened under the direction and in the presence of Government representatives. Failure of

MIL-DTL-28689C

any test shall be cause for rejection of containers and shall be cause for the Government to defer future acceptance until objective evidence furnished by the supplier indicates that deficiencies revealed by the tests have been corrected. The CSC certification tests and the test of 4.5.4 shall be performed on container, with all cabinetry removed from the container.

4.5.1 CSC certification tests. Container certification test shall be witnessed by and CSC certified by an authority approved by the United States Coast Guard. For CSC certification, type I containers shall be tested as specified in ISO 1496-1, type II containers (TRICONs) shall be tested as specified in 4.5.1.1 thru 4.5.1.11. Test No. 8 of ISO 1496-1 does not apply to type II containers. Test 13 of ISO 1496-1 shall be performed last.

4.5.1.1 Test No. 1: Stacking. Three coupled containers in the 1C configuration shall be tested for stacking in accordance with ISO 1496-1. The value of R shall be 44,800 pounds (20 321 kg) for each tier of 1C containers or configurations.

4.5.1.2 Test No. 2: Lifting from the top corner fittings. Three coupled containers in the 1C configuration shall be tested for lifting from the top corner fittings with the lifting forces applied vertically in accordance with ISO 1496-1, and the value of R shall be 44,800 pounds (20 321 kg) for the 1C configuration. The single type II container (TRICON) shall be tested with the appropriate sling angle, and the value of R shall be 14,900 pounds (6 759 kg).

4.5.1.3 Test No. 3: Lifting from the bottom corner fittings. Three coupled TRICONs in the 1C configuration shall be tested for lifting from the bottom corner fittings in accordance with ISO 1496-1, in which case the sling angle is 45 degrees to the horizontal and the value of R is 44,800 pounds (20 321 kg). The single TRICON shall be tested, in which case the sling angle is 60 degrees to the horizontal and the value of R is 14,900 pounds (6 759 kg).

4.5.1.4 Test No. 4: Restraint. Three coupled TRICONs in the 1C configuration shall be tested for restraint in the longitudinal direction in accordance with ISO 1496-1 and the value of R shall be 44,800 pounds (20 321 kg). The single TRICON shall be tested for restraint in the lateral direction and the value of R shall be 14,900 pounds (6 759 kg).

4.5.1.5 Test No. 5: Strength of end walls. One end wall, defined by the height and width of a single TRICON, shall be tested for strength in accordance with ISO 1496-1. The value of P shall be 12,200 pounds (5 534 kg) (14,900 pounds (6 759 kg) maximum gross weight minus 2,700 pounds (1 225 kg) maximum tare weight without cabinetry). Testing the end walls of the 1C configuration is not required.

4.5.1.6 Test No. 6: Strength of side walls. Both side walls, defined by the height and length of a single TRICON, shall be tested for strength, one at a time. The test procedure shall be the same as the end wall testing of the TRICON in 4.5.1.5 in accordance with ISO 1496-1. Three coupled TRICONs in the 1C configuration shall be tested for strength of sided wall in accordance with ISO 1496-1. The test of coupled containers is to determine the adequacy of the connectors and frames as well as the side panels. Both side walls shall be tested, one at a time. The value of P shall be 36,600 pounds (16 602 kg) (12,200 pounds (5 534 kg) per container).

MIL-DTL-28689C

4.5.1.7 Test No. 7: Strength of the roof. The roof of a single TRICON shall be tested in accordance with ISO 1496-1.

4.5.1.8 Test No. 9: Transverse rigidity. Three coupled TRICONs in the 1C configuration shall be tested for transverse rigidity in accordance with ISO 1496-1.

4.5.1.9 Test No. 10: Longitudinal rigidity. Three coupled TRICONs in the 1C configuration shall be tested for longitudinal rigidity in accordance with ISO 1496-1.

4.5.1.10 Test No. 11: Lifting from forklift pockets. The lateral forklift tineways of a single TRICON, with one set of pockets on each side of the container, shall be tested in accordance with ISO 1496-1. The value of R shall be 14,900 pounds (6 759 kg).

4.5.1.11 Test No. 13: Weatherproofness. Each of the three type II containers shall be tested for weatherproofness in accordance with ISO 1496-1.

4.5.2 Door test. The doors of the containers shall be opened and engaged to the securing devices on the side walls. Each door, while secured, shall be pulled with a force of 150 pounds (68 kg). Failure of the door to remain attached to the securing device shall constitute failure of the test. The doors shall then be closed. Failure of the doors to close tightly or failure of the handles to lock shall constitute failure of the test.

4.5.3 Simulated load test. The first article containers shall have the load determined in the following manner. For the bulk containers (style 1), the manufacturer shall determine the total weight of the container (tare weight as defined in 3.4.1). This figure shall then be subtracted from the maximum operating weight of 25,000 pounds (11 340 kg) for type 1, and 10,000 pounds (4 536 kg) for type II containers. The result is the load capacity (L) for that container. The test load shall be evenly distributed in the container. The test load shall be secured to prevent it from shifting during the test. For the configured containers (style 2), the manufacturer shall determine the total weight of the container and installed cabinetry (tare weight as defined in 3.4.1). This figure shall then be subtracted from the air shipping maximum operating weight of 25,000 pounds (11 340 kg) for type I, and 10,000 pounds (4 536 kg) for type II. The result is the L for that container. One drawer or shelves in each stack of cabinetry shall be loaded with 240 pounds (109 kg). These test loads shall be distributed to various levels within the wall configuration, with no more than two of these weights at any particular level. All other drawers and shelves shall be loaded with 160 pounds (73 kg), except drawers with less than 4 inches (102 mm) of usable height may have less than 160 pounds (73 kg). After loading all drawers and shelves with the prescribed test weights, sufficient weight shall be loaded in the aisles to bring the total test weight of the containers to 25,000 pounds (11 340 kg) for a type I container, and 10,000 pounds (4 536 kg) for a type II container. Three type II containers coupled using captive connecting devices described in 3.4.13, shall form an integral 20-foot (6 096 mm) equivalent unit (TEU). Each of the type I containers and the TEU (connected type II containers) shall then be tested as described in 4.5.3.1 thru 4.5.3.3. Test of 4.5.3.2 is for style 2 containers only.

MIL-DTL-28689C

4.5.3.1 Rotational drop test. Place one bottom rail of the container being tested on a nominal 4-inch (102 mm) high block. Raise the opposite bottom rail of the container 12 inches (305 mm) and then allow the unit to fall freely onto a concrete surface using the 4-inch (102 mm) block as a pivot. Perform this test once on each of the four bottom rails of the container.

4.5.3.2 Rail impact test. The railcars shall be American Association of Railroads (AAR) approved for domestic rail freight service. The test car (hammer car) shall be AAR approved for container on flatcar service. The buffer cars shall have no cushioning devices other than standard pocket draft gears. The containers shall be secured to the test car using the test car's AAR approved locking fittings. The container being tested, loaded as described in 4.5.3, shall be mounted on a rail car and subjected to a series of impacts at 4 to 6 miles per hour (mph) (6.4 to 9.7 kilometers per hour (km/h)) against five empty freight cars with their brakes set and draft gear extended. Each container shall be impacted twice in each direction at 4 to 6 mph (6.4 to 9.7 (km/h)) for a total of four impacts. Once the test has begun, there shall be no readjustment of load, nor any reconditioning of the tie-downs except as necessary to reverse the direction of the container.

4.5.3.3 Moving test. The container being tested shall be mounted on a single chassis with tandem bogie and platform body, loaded as specified. The container shall be towed for not less than 250 miles (403 km) at variable speeds up to 55 mph (89 km/h) over hard surface roads, and for not less than 100 miles (161 km) at variable speeds up to 35 mph (56 km/h) over unpaved roads.

4.5.4 Simulated rainfall test. Simulated rainfall test shall be performed on one complete container of each 10 containers presented for delivery. Simulated rainfall shall be produced by a water distribution device of such design that the water is emitted in the form of droplets, is dispersed uniformly over the top, side surfaces, and doors of the container, and impinges directly on the surfaces at an angle of 45 degrees from the vertical. The top and each side of the container shall be exposed to simulated rainfall, at a constant rate of 4.5 ± 0.5 inches (114 ± 13 mm) per hour, for a period of 15 minutes on each side of the container. The use of tape, sheet plastic, caulking or any other weatherproofing techniques is not permitted. Any water leakage, either during the rain test or during actual rain conditions (should they occur) will be considered evidence that the container is not weatherproof, and will require repair and additional testing prior to acceptance.

4.5.5 Failure criteria. Each container shall be inspected after every test for compliance. Cabinetry is not to be removed from containers between tests. Any of the following shall constitute failure of any of the tests specified in 4.5:

- a. Deflection of the container bottom side rails or bottom end frame members of more than 0.25-inch (6 mm) below the bottom plane of the bottom corner fittings.
- b. Deflection of the container crossmembers below the limits specified in 3.4.5.
- c. Evidence of weld failure.
- d. Permanent deformation.

MIL-DTL-28689C

- e. Any broken or torn component.
- f. Any detachment of a gasket.
- g. Inability of one man standing on the ground to open or close a door without the use of tools while the container is sitting on level ground.
- h. Inability of one man standing on the ground to operate a latching mechanism without the use of tools while the container is sitting on level ground.
- i. Detachment of cabinetry from mounting system.
- j. Failure of any cabinetry mounting and bracing system components.
- k. Failure of drawers and shelves to support specified loads.
- l. Failure of drawers to operate without binding.
- m. Any dimensions after a test not within the specified tolerance.
- n. Penetration of water into the interior of the container.
- o. Failure of the captive connecting devices to maintain a tight connection (type II containers).

5. PACKAGING. The preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES

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

6.1 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Type and style required (see 1.2.1).
- c. Number of containers, and of the type, style, and configuration required for and approval (see 3.2 and 4.2.1).

MIL-DTL-28689C

6.2 National Stock Numbers (NSN). NSNs applicable to this document are as follows:

<u>NSN</u>	<u>Nomenclature</u>
1095-00-407-0674	Gun rack
5410-01-363-7086	Connectors
8110-01-286-7464	Plug, expansion 2-inch inside

	<u>Container</u>	<u>Wall Configuration</u>
8145-01-287-3293	STD 20	- -/5B
8145-01-287-3294	TRICON	Bulk
8145-01-287-3295	STD 20	4A/4B
8145-01-287-8563	TRICON	Armory
8145-01-287-8564	TRICON	D3C
8145-01-287-8565	STD 20	Armory
8145-01-287-8566	STD 20	5A/5B
8145-01-287-8567	STD 20	Bulk
8145-01-288-9697	STD 20	4A/5B
8145-01-289-0944	STD 20	4A/3B
8145-01-289-0945	TRICON	D2A/D2B
8145-01-289-3366	STD 20	3A/ 2B
8145-01-289-3367	STD 20	2A/5B
8145-01-289-3368	STD 20	3A/5B
8145-01-289-4329	TRICON	D1A/D1B
8145-01-290-1382	STD 20	4A/--

6.3 Subject term (key word) listing.

Bulk
Configured
ISO container
TRICON

6.4 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 227.405-70 are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

MIL-DTL-28689C

6.5 First article. When a first article inspection is required, the item will be tested and should be a first production item, or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one of each style of type I container and three of the type II containers. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

Custodian:

Navy - YD1

Army - GL

Review Activities:

Navy - OS

Preparing Activity:

Navy - YD1

(Project 8145-0061)