

INCH-POUND

MIL-PRF-32349

25 March 2011

SUPERSEDING

ATPD 2298C

5 March 2010

(See 6.10)

PERFORMANCE SPECIFICATION

CONTAINER, CARGO
TRIPLE CONTAINER (Tricon)
(WITHOUT CABINETS, DRAWERS, OR SHELVES)

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

1. SCOPE

1.1 Scope. This specification describes a 6 feet (ft) 5-1/2 inches (in) wide by 8 feet (ft) long by 8 ft high (1968 millimeters (mm) by 2438 mm by 2438 mm) (external measurements) reusable International Standards Organization (ISO) compatible triple container (Tricon) used for the storage, transportation and distribution of dry cargo.

1.2 Description. Tricons will be available in two types as follows:

TYPE 1 - One set of double doors, located on one 6 ft 5-1/2 in (1968 mm) forward side, only.

TYPE 2 - Two sets of double doors, located on each of the 6 ft 5-1/2 in sides (1968 mm) forward and aft sides.

Tricons will be manufactured to the latest ISO standards and their corresponding amendments as described in this document. Three Tricons, when coupled together, will be an ISO-compatible empty shell container with tie downs and will measure 19 ft 10-1/2 in wide by 8 ft long by 8 ft high (6058 mm by 2438 mm by 2438 mm) (external measurements) and will be in accordance

Comments, suggestions, or questions on this document should be addressed to U.S. Army RDECOM, Tank Automotive Research, Development and Engineering Center, ATTN: RDTA-EN/STND/TRANS MS #268, 6501 E. 11 Mile Road, Warren, MI 48397-5000 or emailed to DAMI_STANDARDIZATION@conus.army.mil . Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil .
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with this specification. Throughout this document, three Tricons when coupled are referred to a 20-foot module or container.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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 of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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 cited in the solicitation or contract (see 6.2).

FEDERAL SPECIFICATIONS

TT-C-490 - Chemical Conversion Coatings and Pretreatments for Ferrous Surfaces (Base for Organic Coatings)

FEDERAL STANDARDS

FED-STD-595/34094 - Green 383

COMMERCIAL ITEM DESCRIPTIONS

A-A-59745 - Zinc-Rich Coatings

DEPARTMENT OF DEFENCE SPECIFICATIONS

MIL-DTL-53072 - Chemical Agent Resistant Coating (CARC) System, Application Procedures and Quality Control Inspection

(Copies of these documents are available from <https://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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

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CODE OF FEDERAL REGULATIONS (CFR)

- 49CFR450 - Coast Guard, Department of Homeland Security, General
- 49CFR451 - Coast Guard, Department of Homeland Security, Testing and approval of containers
- 49CFR452 - Coast Guard, Department of Homeland Security, Examination of containers
- 49CFR453 - Coast Guard, Department of Homeland Security, Control and enforcement

ARMY REGULATIONS (AR)

- AR 70-38 - Research, Development, Test and Evaluation of Materiel for Extreme Climatic Conditions (15 Sept 1979)

(Copies of these documents are available from www.gpoaccess.gov/cfr/index.html or U.S. Government Printing Office, P.O. Box 979050, St. Louis, MO 63197-9000.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract (see 6.2).

ASTM INTERNATIONAL

- ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test

(Copies of these documents are available from www.astm.org or ASTM International, P.O. Box C700, West Conshohocken, PA 19428-2959.)

GENERAL MOTORS CORPORATION (GM)

- GMW14872 - Cyclic Corrosion Laboratory Test - English

(Copies of this document are available from General Motors North America, c/o Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112 or www.ihs.com or as directed by the contracting officer.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

- ISO 668 - Containers, Series 1 Freight, Classification, Dimensions and Ratings (DoD Adopted)
- ISO 1161 - Containers, Series 1 Freight - Corner Fittings - Specification (DoD Adopted)

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- ISO 1496-1 - Containers, Series 1 Freight - Specification and Testing - Part 1: General Cargo Containers for General Purposes Amendment 1: 1C Containers (DoD Adopted)
- ISO 6346 - Freight Containers - Coding, Identification and Marking

(Copies of these documents are available from www.iso.org or www.ansi.org or ANSI Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Materials. The materials selected for construction of the containers and connecting couplers are the responsibility of the contractor and shall be in accordance with applicable federal, military or national technical society, association or institute specification or standard. The materials shall be of sufficient durability to meet all the performance requirements as specified herein. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Toxic chemicals, hazardous substances, or ozone depleting chemicals (ODCs) shall not be used. No radioactive materials, mercury, or cadmium plating shall be used. Care shall be exercised during design and in all material selection to reduce or eliminate the need for hazardous materials and emissions of volatile organic compounds (VOCs) throughout the product's lifecycle.

3.2.1 Material deterioration, prevention, and control. The containers and connecting couplers shall be fabricated from materials, inherently corrosion resistant such as galvanized steel to G-90 level, stainless steel or composites or treated materials that provide protection against the various forms of corrosion and deterioration that may be encountered in all of the operating and storage environments addressed in 3.4. All container designs shall be evaluated for corrosion prevention and control by the GMW14872 Cyclic Corrosion Laboratory Test (CCLT) for 120 cycles to qualify the system (pretreatment, coating type(s) and coating thicknesses). The containers shall operate for a minimum of 20-year service life without performance degradation due to corrosion. No actions beyond normal washing, scheduled maintenance (exclusive of paint touch up), repair of accidentally damaged areas (not a result of intended use, deficiency in design, materials, manufacturing or normal wear), and replacement of damaged paint shall be necessary to keep the corrosion prevention in effect. To meet the nuclear biological and chemical (NBC) survivability requirements, materials shall be selected which can be decontaminated without degradation when cleaned with DS2. The connecting couplers (see 3.5.5) shall be considered part of the container and shall also meet the 20-year service life;

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regardless that normal use of couplers could degrade standard corrosion protection methods. All container designs shall be tested and evaluated for corrosion prevention in accordance with 4.4.3.

3.2.2 Treatment and painting. The containers shall be made of inherently corrosion resistant materials, or if made of aluminum or steel, shall be treated to provide corrosion resistance for an expected life of 20 years. The containers shall be cleaned, pretreated, primed and painted in accordance with the coating manufacturer's recommendations for the specific coating system that shall be used. The application of the CARC system shall be performed in accordance with MIL-DTL-53072 on all interior and exterior metal surfaces unless otherwise specified (see 6.2). All organic zinc rich coatings shall be in accordance with A-A-59745 with exception that the zinc content shall be 85% or higher by weight in dry film. Top-coat color shall be green 383, #34094 of FED-STD-595 unless otherwise specified (see 6.2). Coating system shall be selected to provide resistance to environmental degradation and coating chipping (see 4.4.6). The color of interior surfaces shall be green 383, #34094 of FED-STD-595 unless otherwise specified (see 6.2). When specified, in addition to CARC painting, the underside of the containers shall be undercoated with Tectyl 121B 2.8 Volatile Organic Content (VOC) (Daubert Chemical Company) to further prevent corrosion (see 6.2). A product with equivalent characteristics may be used in lieu of Tectyl 121B 2.8 VOC (see 6.2). Any welds and heat affected zones in galvanized steel shall be coated by zinc rich primer or thermal spray zinc to restore the zinc finish or provide equivalent protection provided by the zinc. Galvanized steel shall be pretreated with zinc phosphate per TT-C-490.

3.2.3 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion.

3.2.4 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. Used, rebuilt or remanufactured components, pieces, and parts shall not be incorporated into the container. Materials not specified shall be in accordance with applicable federal, military, or national technical society, association or institute specifications or standards.

3.2.5 Construction. The container shall be constructed to minimize recesses and voids where moisture can accumulate. No part of the container shall protrude beyond the outside plane surfaces of the corner fittings.

3.3 Operating and design requirements.

3.3.1 Description. Each Tricon shall be 6 ft 5-1/2 in wide by 8 ft long by 8 ft high (1968 mm by 2438 mm by 2438 mm) and shall be suitable for repeated use, waterproof, and non-collapsible. Used materials or components shall not be used as part of any Tricon. Three Tricons, when coupled together, shall hereinafter be referred to as a container for the purposes of this specification, and shall become a 19 ft 10-1/2 in by 8 ft by 8 ft (6058 mm by 2438 mm by 2438 mm) ISO-compatible container with tie downs, universal shelving brackets, and decking

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beams when specified (see 6.2) in accordance with this specification and figures 1 through 7. Shelf decking beams, beyond what is required for test in paragraph 4.4.5 shall be provided with each Tricon when specified (see 6.2). Unless otherwise specified herein, the container shall be compatible with the requirements of ISO 1496-1. The three Tricons coupled shall be rated for 44,800 pounds (20,321 kg) gross weight. The tare weight of each Tricon shall not exceed 2,600 pounds (1,179 kg) for Type 1 and 2,800 pounds (1,270 kg) for Type 2. An individual Tricon shall be rated at 14,900 pounds (6,759 kg) gross weight. The construction of the three coupled Tricons shall allow for stacking according to ISO 1496-1 for 1C containers. Reference herein to any specific commercial company, product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the Department of the Army (DoA), and shall not be used for advertising or product endorsement purposes.

3.3.2 Doors. Doors shall conform to ISO 1496-1 except as specified in this paragraph and in table I. Each door shall have a mechanically attached gasket (seal) capable of meeting all operating environment requirements of 3.4, 3.4.1, and 3.4.2, including conditions of high heat and relative humidity (RH) combined (+140 °F and 95% RH) to provide a weathertight seal. Doors shall be hung on the 6 ft 5-1/2 inch (in) (1968 mm) container frame and shall open to not less than the dimensions specified in below table. Tricon door opening dimensions shall be the same for both Type I and Type II Tricons. Each door shall be provided with minimum one exterior heavy-duty, handle operated cam-locking device with anti-rack provisions, which through lever type action aids in releasing the door seal from the doorframe. Each locking device handle must be capable of accepting a padlock and security seal. All locking rods (see figure 3) shall be mounted such that they cannot be removed by mechanical means from the exterior side of the container to defer pilfering and gain access to the container contents. Means shall be provided to hold and secure the doors in the full open position and shall be of a material which shall not scrape or chafe the container when the doors are closed. All moving parts of the door locking mechanism and door hinges shall be permanently lubricated.

TABLE I. Tricon door opening dimensions (all dimensions are minimums).

Tricon Type	Height	Width
Type I and Type II	7 ft 1-1/2 in (+0,-3/16 in) (2171.7 mm (+0, -4.762 mm))	6 ft 1-5/8 in (+0,-3/16 in) (1870.075 mm (+0, -4.762 mm))

3.3.3 Side walls, end walls, door walls, roof and floor strength. Strength requirements for containers shall meet ISO 1496-1 and shall withstand loading in accordance with ISO 1496-1 test procedures. All Tricon end and side walls, shall meet the ISO 1496-1 strength requirements for side walls.

3.3.4 Floor. The floor shall be watertight and shall be permanently attached to its bottom side rails and cross members. The floor shall be designed and installed to support the container's payload (P_g) as defined in 6.1.1 of ISO 1496-1.

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3.3.5 Roof. The roof shall be self-draining and its roof strength (per ISO 1496-1) shall allow less than 1/4 in (6.35 mm) permanent deflection. No water shall leak into the container, and the roof shall retain not more than 1/8 inch of water when the Tricon is tested in accordance with the ISO 1496-1 weatherproofness test (test number 13) and is level to within 5 degrees.

3.3.6 Seams. Tricon seams shall be sealed with chloroprene/neoprene type sealant where necessary such that the Tricon shall be weathertight.

3.3.7 Anti-pilferage 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, shall be 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 protective coating and the surrounding areas shall be restored to the original condition. All locking device handles shall be furnished with provisions for padlocking and customs sealing. When specified (see 6.2), the locking provisions shall include a steel locking bar and security seal system to deter pilfering, and to permit the rapid identification of tampering used to gain access to the container. When connected and when specified (see 6.2), the locking bar shall be secured to both the left and right door locking rod on each set of double doors provided, and the security seal or cable shall be connected to both the locking rod (see figure 3) and the door catch mechanism in lieu of a padlock (the security seal or cable shall be a bright color such that it is easily recognizable when it has been removed and tampering has occurred). All locking rods (see figure 3) shall be mounted such that they cannot be removed by mechanical means from the exterior side of the container to defer pilfering and gain access to the container contents.

3.3.8 Shoring slots. Type 1 Tricons shall have shoring slots on both interior walls immediately adjacent to the one set of double doors, from floor to ceiling. Type 2 containers shall have shoring slots on both interior walls, immediately adjacent to each set of double doors, from floor to ceiling. All shoring slots shall begin inside the Tricon not more than 1/2 in (12.7 mm) from the closed-doors to restrain the cargo and prevent it from forcing the door open during sudden stops or tilts of the container during transportation. The shoring slots shall be a minimum of 51 mm (2 in) wide to allow for the attachment of round shoring support bars. The shoring slot shall be fabricated to support 0.4 times the force by the maximum permissible payload, as defined in this specification, applied in the longitudinal direction at any point along the shoring slot. The spacing of the shoring bar supports, in each shoring slot, shall be every 15 in (381 mm) starting at the floor. Five (5) shoring bar supports shall be fabricated from 0.5-in (12.7 mm) round bar, and shall be located in each slot. Door opening dimensions as specified in 3.3.2 shall not be obstructed by the shoring slots.

3.3.9 Universal shelving tracks. Each Tricon shall contain five Series E or Series A vertical tracks (see 6.5) which are made of high strength 12-gauge steel. Each set of five tracks shall be individually welded on each side wall, and as identified on figure 2. A minimum of fifteen 1-in (25.4 mm) welds, equally spaced apart, shall be used on each side of each vertical track. Vertical tracks shall start within 4 in (101.6 mm) of the floor and extend to within 4 in

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(101.6 mm) of the roof. All tracks shall be one continuous length, and shall correspond with one another and be of the same distance from the floor (± 0.12 in) (± 3.048 mm).

3.3.10 Shelf decking beams. Shelf decking beams shall meet the requirements stated herein. The length of the decking beam shall be adjustable to accommodate variations in the distance between vertical shelf tracks caused by distortion during use. Beams, when connected to the Series E or Series A vertical tracks, shall be positively secured in all directions (i.e., right to left, and up and down). The beam connection shall have some type of locking device that secures the beam to the Series E or Series A vertical shelf track. This locking device shall allow easy and quick installation and removal of the beam without the use of a tool. The decking shelf shall have a working load capacity rating of not less than 2,000 pounds (907 kg) uniformly distributed over a shelf spanning three beams as depicted on figure 2, and connected at the same level to each vertical track. Shelf decking beams, beyond what is required for test in paragraph 4.4.5, shall be provided with each Tricon when specified (see 6.2).

3.3.11 Vents. All containers shall have minimum of two passive ventilating systems comparable to those used on commercial ISO containers. The vents shall be located in upper diagonal corners on opposite walls or doors such that they provide maximum diagonal cross airflow and hot air exhaust, and they shall be designed to deflect rain or spray and prevent water ingress. As a minimum, the external venting surface area of each vent shall be 452 mm^2 (0.7 in^2) to permit depressurization of the Tricon. When specified (see 6.2) vents shall be able to be opened and closed, without tools, from the outside of the Tricon. There shall be no air flow through the vents when they are in the closed position. These opening and closing vents shall have spring hold assists in both the opened and closed positions such that they shall remain in their set position.

3.3.12 Manifest box. Two manifest boxes shall be provided on each container (see 6.6). One shall be securely and rigidly fastened to the inside of the right hand door, and one to a flat surface of the outside upper portion of the right hand door as depicted on figure 3. The manifest box on the inside shall not interfere with the shelving area at any level. The manifest box on the outside shall be designed and located in an area that minimizes interference or damage with forklift carriages and backrests being used to lift the Tricon. The manifest box shall be weathertight with a hinge type cover, painted to match the interior or exterior color. The manifest box shall be designed to hold an 8-1/2 in by 11 in by 1-1/4 in thick document (215.9 mm by 279.4 mm by 31.75 mm).

3.4 Operating environmental requirements. The container shall operate under the following environmental conditions without degradation in performance, material failures, or permanent deformation. The container shall be capable of uncovered long term storage in extreme hot and cold climate, high humidity, blowing sand, dust, heavy snows, mud, soft ground, earthquakes, debris, or combination of the above, as defined in AR 70-38 to include stowage on Pre-Positioning (PREPO) afloat vessels up to 30 months without loss of mission essential functions with routine unit-level (i.e., -10 level) maintenance performed every six months. Mission essential functions shall be defined as being transportable by all modes in 3.5.9 through 3.5.9.5, and being able to safely stow a full payload without any damage or deformation.

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3.4.1 Storage and transit temperature. The container shall not be damaged by storage or transit in temperature conditions from -40 °F (-40 degrees Celsius (°C)) to +160 °F (+71.1 °C).

3.4.2 Operation in rain. The container shall not exhibit water leakage when subjected to the ISO 1496-1 weatherproofness test (test number 13).

3.5 Interface requirements.

3.5.1 Weight, ratings and dimensions. The tare weight of the empty container shall not exceed 2,600 pounds (1,179 kg) for Type 1 and 2,800 pounds (1,270 kg) for Type 2. The maximum gross weight rating of an individual Tricon shall be a maximum of 14,900 pounds (6,759 kg). The three Tricons coupled as a single container shall have a maximum gross weight rating of 44,800 pounds (20,321 kg) (Type 1 and Type 2). The minimum internal dimensions and actual external dimensions and tolerances shall be in accordance with table II. Interior length dimensions from the interior back wall sill to the edge of the connector-locking holder device (see 3.5.6) located on the bottom half of the interior of the right door at the hinge side shall be no less than 7 ft 3-1/2 in (2222.5 mm). The external dimensions of three Tricons coupled as a single container shall become a 19 ft 10.5 in by 8 ft by 8 ft (6058 mm by 2438 mm by 2438 mm) ISO-compatible container. Unless otherwise specified herein, the container shall be in accordance with the requirements of ISO 1496-1. Also, unless otherwise specified herein, the minimum internal dimensions, actual external dimensions, tolerances, and diagonal differences of the container shall be in accordance with ISO 668.

TABLE II. Tricon dimensions.

	Length	Width	Height
Interior	6 ft 2-1/16 in (1881.187 mm)	7 ft 6-1/2 in (2298.7 mm)	7 ft 2-1/2 in (2162.5 mm)
Exterior	6 ft 5-1/2 in (+0, -1/16 in) (1968.5 mm (+0, -1.587 mm))	8 ft (+0, -3/16 in) (2438.4 mm (+0, -4.762))	8 ft (+0, -3/16 in) (2438.4 mm (+0, -4.762))

3.5.2 Forklift pockets and relief notches. The container shall have forklift pockets that conform to ISO 1496-1, Annex C. The Type 1 and Type 2 containers shall have four-way entry, and the entry points shall not interfere with the doors or door height requirements in 3.3.2. A relief notch shall be provided along the bottom rail at the corner block on all four sides of each Tricon.

3.5.3 Corner fittings. All eight corner fittings on each Tricon shall be bottom corner fittings as specified in ISO 1161 to permit horizontal coupling between containers. The corner fittings shall be mounted to the container so that the elongated top and bottom apertures are parallel to the door end of the Tricon.

3.5.4 Tie downs. Type 1 Tricons shall be provided with top rail, bottom rail and corner post tie-downs per 3.5.4.1 and 3.5.4.2. Type 2 Tricon shall be provided with top rail and bottom rail tie-downs per 3.5.4.1. All tie downs shall be capable of accepting hooks with 1-in (25.4 mm)

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wide metal strapping without tearing the strapping. Adequate clearance shall be provided at the tie down for attachment of a metal hook with adjustable webbing, and with minimum hook dimensions as specified on figure 7. All tie-downs shall withstand a 4,000-pound load at an angle of 45-degrees from the horizontal and 45 degrees from the vertical without permanent deformation. The tie down provisions shall restrain the load without any of the following: weld failure; permanent deformation; cracking; and loosening or breaking of the provision or its connecting structural components. Conduct tie down tests in accordance with 4.4.2.

3.5.4.1 Top and bottom rail tie downs. A total of 24 top and bottom rail loop tie downs for Type 1 Tricon shall be provided in each container as depicted on figure 1, and as in below table III. Four loop tie downs shall be provided and welded on the bottom rail and four on the top rail of each enclosed side wall and four on the top and bottom of the aft (opposite the door) wall. The four tie downs on each rail shall be set into the recess of wall corrugations so as not to impinge on the usable interior cubic volume of the container. Type 2 Tricons shall have 4 loop tie downs welded on the top and bottom rails of each enclosed wall for a total of 16 loop tie downs as shown in Table III. All loop tie downs shall be constructed of 1/2-in (12.7 mm) rod steel and formed into a loop as depicted on figures 1 and 8. All top and bottom rail loop tie downs shall be positioned so that one tie down is near each corner and the remaining are equally spaced as depicted in figure 1.

3.5.4.2 Corner post tie downs (Type I only). Type 1 containers shall have 5 tie downs on each of the two corner posts opposite the door as shown on figure 1. Corner post tie downs shall be positioned at 15, 30, 45, 60, and 75 ($\pm 1/2$) in respectively (381, 762, 1143, 1524, and 1905 (± 12.7) mm respectively) and from the floor as depicted on figure 1, and as in below table III. Corner post tie downs shall be constructed of 1/2-inch (12.7 mm) rod steel and welded to the corner post as depicted on figure 1.

TABLE III. Configuration of tiedowns.

Tricon Type	Top Rails (loop tie downs)	Bottom Rails (loop tie downs)	Corner Post
Type 1	12 total (4 each side and back)	12 total (4 each side and back)	10 total (5 each side)
Type 2	8 total (4 each side)	8 total (4 each side)	None

3.5.5 Tricon connecting couplers. Three Tricons shall be coupled with connectors to form an integral 20-foot (6096 mm) module or container, which is dimensionally equivalent to, and does not violate, ISO envelope requirements for the standard ISO 1C container, unless otherwise specified herein. The coupling process shall not take more than 30 minutes using the connecting couplers provided with the three containers, 2 guides, and one forklift truck to position and assist in the connection. All connecting couplers shall be one-piece assembly units, and all connecting coupler parts shall be capable of being operated and connected to the container without any tools. Each connecting coupler shall be capable of being securely fastened to a single container's corner fitting allowing the connection to be made first to one container and then to another. The deflection of the long bottom rail below the surface of the corner fittings of an individual Tricon container shall not exceed 1 in (25.4 mm) after being lifted with a

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test load from the 4 top corner fittings on an assembled 20-foot (6096 mm) module or container; and lifted with a test load on an individual Tricon container. The four top corner fittings shall be bottom corner fittings as specified in ISO 1161 to permit horizontal coupling between containers (see 3.5.3). Testing shall be in accordance with 5.3.4 of ISO 1496-1 and 4.4.9 herein, and each individual Tricon container shall be loaded so that the combined mass of the individual Tricon container with its test load is 1.8 times the rated capacity load of each Tricon container (i.e., 1.8R). The currently used coupling NSN is 3040-01-387-4048, although all connecting couplers that meet the requirements of paragraph 3.5.5 shall be permitted.

3.5.6 Connecting couplers, quantity and storage. Each container shall be provided with three connecting couplers conforming to the requirements identified above. A connector-locking holder device shall be provided to secure and store three connecting couplers. The device shall be located on the bottom half of the interior of the right door, at the hinge side. The depth of the device shall not exceed 4-5/8 in (117.475 mm). The length and width of the device shall be reasonably sized to allow adequate storage and ease of use, not reduce specified internal dimensions of the container, or interfere with the capability of shelves to be raised up or down.

3.5.7 Container stacking. The construction and design of the Tricons shall permit stacking of the three coupled Tricons as a 20-foot (6096 mm) module or container in accordance with ISO 1496-1 for 1C containers (Test 1).

3.5.8 Convention for Safe Containers (CSC) certification. The container design and each Tricon shall be certified in accordance with 49CFR, Parts 450 through 453. The 9-high stacking test shall be for three (3) Tricons coupled together supporting loaded ISO 668, 1C containers in accordance with ISO 1496-1. The CSC plate data shall show the 9-high stacking certification.

3.5.9 Transportability. Individual Tricons and three Tricons coupled together to form an equivalent ISO 1C container unless specified herein, shall be transportable by air, highway, marine and rail assets as specified herein. The individual container, and three containers coupled together, shall also be capable of being stacked and transported by military and commercial vehicles, and trailers, trains, marine vessels, aircraft, dolly sets, forklifts, and cranes; and shall withstand the impact forces encountered in shipment and loading without damage or permanent deformation.

3.5.9.1 Air transportability. Three coupled Tricons, and individual Tricons, shall be internally air transportable by C-130, C-5, and C-17 aircraft. Three coupled Tricon containers, and individual Tricons, shall be externally transportable by a CH-47 helicopter by sling.

3.5.9.2 Rail transportability. Three Tricons coupled together as a 20-foot (6096 mm) container or module, and individual Tricons shall be rail transportable in CONUS and NATO countries without restriction.

3.5.9.3 Marine transportability. Three Tricons coupled together as a 20-foot (6096 mm) container or module, and individual Tricons shall be transportable by breakbulk cargo ships, Roll-On/Roll-Off (RORO) ships; C-8 and larger, Lighter Aboard Ship (LASH); barge carrying

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ships (SEABEE); Lighter, Amphibious, Resupply, Cargo (LARC)-LX, and larger lighter vessels; Landing Craft Utility (LCU); Landing Craft Mechanized (LCM); Landing Craft Utility (LCU) 1646 and LCU 2000 lighters and the Logistics Support Vessel (LSV); and Army barges and lighters in accordance with MIL-STD-1366. Individual Tricons, and three Tricons coupled as a 20-foot (6096 mm) container or module shall withstand, without damage, the shock, rolling and pitching normally experienced in marine transportation on the deck or in the hold of the cargo vessel.

3.5.9.4 Highway transportability. Three Tricons coupled together as a 20-foot (6096 mm) container or module, and individual Tricons shall be capable of unrestricted highway transport.

3.5.9.5 Loading and handling equipment. Individual Tricons, and Tricons coupled in the two and three configuration, fully loaded, shall be able to be lifted and handled by suitably rated forklifts and cranes so that they may be transported in all the modes described in 3.5.9 through 3.5.9.4.

3.6 Support and ownership requirements.

3.6.1 Exterior markings. Each Tricon shall be marked in accordance with ISO 6346. Example locations for the required markings are provided in figures 3 through 6, although other locations may be used provided that they conform to ISO 6346 and contain all the required data and information. The location of the other optional markings may be specified at the time of purchase by the customer. If specified at the time of purchase, the contractor may obtain the user's serial numbers from the contracting officer (see 6.2). Unless otherwise specified, the contractor shall stencil in 1-in (25.4 mm) letters on the exterior of the left hand door panel in the area below the CSC data plate, and as shown on figure 3: "CARC" and the month and year the Tricon was painted, using a two digit numerical format.

3.6.2 Interior markings. The owner's code, serial number, and check digit, as defined by ISO 6346, shall be stamped in characters not less than 1/2-in (12.7 mm) high or bead welded in not less than 1-1/2 in (38.1 mm) high on the interior surface of the door end top rail (header). The number shall be located on either the top left corner fitting or within an area of 18 in (457.2 mm) from the left corner post where it shall not be obscured.

3.6.3 Approval plates. An International Convention for Safe Containers (CSC), Transport Internationale des Routiers (TIR), and Timber Component Treatment Requirements, if applicable, of the Australian Department of Health (TCT) plates or plaques shall be applied for and obtained from a designated approval authority and attached and displayed as required by the CSC, in accordance with 49CFR450 through 49CFR453. Each Tricon shall be affixed with the seal of the approval authority.

3.6.4 Consolidated data plate. The Consolidated Data Plate shall contain: Transport Internationale des Routiers (TIR) markings; Manufacturer's Data Plate markings; and CSC plate

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data required in 3.5.8. The height of the data plate shall be no less than 250 mm (9.8425 in). The location of the consolidated data plate shall be as depicted on figure 3.

3.6.5 Workmanship. Each Tricon shall have no evidence of cracks, dents, scratches, burrs, sharp edges, pinching hazards, loose parts, missing fasteners, distortions, spatter, foreign material, or any other cosmetic or structural defects which may degrade the performance requirements of this specification.

4. VERIFICATION

4.1 Classification of inspections. Inspections shall be classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. When a first article inspection is required (see 6.2), it shall be performed on an individual Tricon as well as on three completed Tricons connected together. For the individual Tricon, the inspection shall include the conformance examinations per table IV and the testing in 4.4. Three Tricons coupled together shall be tested in accordance with 4.4.1. Nonconformance to any specified requirements or the presence of one or more defects shall be cause for rejection.

4.3 Conformance inspection.

4.3.1 Examination. Each Tricon production unit shall be examined through document and visual method as specified in table IV. Nonconformance to any specified requirements or the presence of one or more defects shall be cause for rejection.

4.4 Testing. All retest of failed parts shall be at the contractor's expense. Any loss of form, fit, or function of the Tricons during testing shall be considered a failure and shall require corrective action as required by the contract. Expendable items (identified prior to the test) shall retain their function for their intended service life and are not subject to these criteria.

4.4.1 Tests. Using the coupling connectors, three Tricons shall be connected to form an integral 20-foot (6096 mm) module or container. The 20-foot (6096 mm) module or container shall then be subjected to all the tests as described in ISO 1496-1 with the exception of the floor test. The weatherproofness test shall be performed as the last ISO 1496-1 test. In addition, the coupled Tricons shall be certified for CSC 9-high stacking, and tested in accordance with ISO 1496-1 for CSC 9-high stacking (see 3.5.8). Nonconformance to 3.5.7 and any requirement in section 3, the failure of any test, or the presence of one or more defects shall be cause for rejection.

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TABLE IV. Examination schedule.

Number	Test/Examination	Reference requirement paragraph	First article	Conformance
101	Materials not as specified	3.2	X	X
102	Corrosion Control Performance not as specified.	3.2.1	X	
103	Protection and coating adherence not as specified	3.2.2	X	X
104	Coating thickness not as specified	3.2.2	X	X
105	CARC painting missing or not as specified	3.2.2	X	X
106	Color not as specified	3.2.2	X	X
107	Dissimilar metals are not effectively insulated from each other	3.2.3	X	X
108	Used, rebuilt, or remanufactured components, pieces, or parts used	3.2.4	X	X
109	Construction not as specified.	3.2.5	X	X
110	Components missing or not as specified	3.3.1	X	X
111	Doors missing or not as specified	3.3.2	X	X
112	Side walls missing or not as specified	3.3.3	X	X
113	End walls missing or not as specified	3.3.3	X	X
114	Floor missing or not as specified	3.3.4	X	X
115	Roof missing or not as specified	3.3.5	X	X
116	Seams not as specified	3.3.6	X	X
117	Anti-pilferage provisions missing or not as specified	3.3.7	X	X
118	Restraint system/shoring slots missing or not as specified.	3.3.8	X	X
119	Universal shelving brackets missing or not as specified	3.3.9	X	X
120	Universal shelving track welds missing or not as specified	3.3.9	X	X
121	Decking beams missing or not as specified	3.3.10	X	X
122	Vents missing or not as specified	3.3.11	X	X
123	Manifest box missing or not as specified	3.3.12	X	X
124	Weight not as specified	3.5.1	X	
125	Dimensions not as specified	3.5.1	X	X
126	Forklift pockets and relief notches missing or not as specified	3.5.2	X	X
127	Corner fittings missing or not as specified	3.5.3	X	X
128	Tie downs missing or not as specified	3.5.4	X	X
129	Loop tie downs missing or not as specified	3.5.4.1	X	X
130	Corner post tie downs missing or not as specified	3.5.4.2	X	X

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TABLE IV. Examination schedule – continued.

Number	Test/Examination	Reference requirement paragraph	First article	Conformance
131	Connecting couplers missing or not as specified	3.5.5, 3.5.6	X	X
132	Deflection not as specified.	3.5.5	X	X
133	Stacking not as specified.	3.5.7	X	X
134	Exterior markings missing or not as specified	3.6.1	X	X
135	Interior markings missing or not as specified	3.6.2	X	X
136	Approval plates missing or not as specified	3.6.3	X	X
137	Consolidated data plate missing or not as specified	3.6.4	X	X

4.4.2 Tie down testing. Ability of the tie downs to accept strapping hooks and withstand required loads shall be verified. Loads applied to each tie down provision shall be measured with an appropriate measuring device, such as a load cell. Analysis and testing shall be as follows:

- a. An interface test shall be conducted on each type of tie down provision using a hook with minimum dimensions as specified on figure 8. The tie down provisions shall permit the hook to fully engage with the tie down provision. The hook shall not be blocked, or its movement restricted, by the container wall or post. Adjustment of the strapping shall not be restricted. The tie down provisions shall not cause tearing or other damage to the strapping.
- b. A load of 6,000 pounds shall be applied statically and independently at an angle of 45-degrees from the horizontal and 45 degrees from the vertical, and shall be conducted on each tie down provision; and each tie down provision may be tested individually.
- c. The 6,000 pound load shall be applied statically and independently for not less than 6.0 seconds.
- d. The points used to apply the load to the tie down shall be located so they do not interfere with or reduce the loading on the structural member next to the tie down provisions.
- e. Failure of the tie down provisions to perform as specified in 3.5.4 shall constitute failure of this test.

4.4.3 Corrosion test. Nonconformance to 3.2 through 3.2.5 shall constitute failure of this test.

- a. All container, container connecting couplers, and Tricon designs shall be evaluated for corrosion prevention and control. The GMW14872 CCLT shall be performed for

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- 120 cycles to qualify the system (pretreatment, coating type(s) and coating thicknesses). To evaluate corrosion resistance, a minimum of six test coupons for each material variation and process shall be manufactured with the substrate and coating system that shall be used in production. Test coupons (4 in (101.6 mm) by 12 in (304.8 mm)) shall be scribed through the coating system to the substrate prior to testing. Test coupons shall be fabricated with and without CARC topcoat. There shall be no more than 1 mm scribe creep (measured from one side of the scribe) after scraping with a metal putty knife after 120 cycles of testing. There shall be no blistering and no more than 5 rust spots in any 24 square in (15,483.84 square mm) of test surface. All twelve test coupons of each test variation shall meet these acceptance requirements to be considered an acceptable design.
- b. A minimum of four connector couplings for each material variation and process shall be manufactured with the substrate and coating system that shall be used in production. Connector couplings shall be scribed through the coating system to the substrate prior to testing. Connector couplings shall be fabricated with and without CARC topcoat. There shall be no more than 1 mm scribe creep (measured from one side of the scribe) after scraping with a metal putty knife after 120 cycles of testing. There shall be no blistering and no more than 5 rust spots in any 2 square in (1290.32 square mm) of test surface. All 8 connector couplings of each test variation shall meet these acceptance requirements to be considered an acceptable design.
 - c. All retest of failed parts shall be at the contractor's expense.
 - d. Pass - Fail Criteria: Any loss of form, fit, or function shall be considered a corrosion failure and requires the same type of corrective action during or after the GMW14872 CCLT as any other failure occurring during or after the Initial Production Test (IPT). Expendable items (identified prior to the test) shall retain their function for their intended service life and are not subject to these criteria.

4.4.4 Weatherproofness test. The weatherproofness test shall be performed as indicated in ISO 1496-1 (test number 13). The self-draining test shall be performed simultaneously. Nonconformance to 3.3.5 and 3.4.2 shall constitute failure of this test.

4.4.5 Shelf decking beam test. The decking beams shall meet the working load capacity as specified in 3.3.10. A 3/4-in (19.05 mm) shelf shall be used for the purpose of conducting this test. The shelf shall span the entire length and width of the Tricon interior. Install the first 3/4-in (19.05 mm) plywood shelf at 2 feet \pm 2 in (609.6 mm \pm 50.8 mm) from the floor of the Tricon, and then install three subsequent 3/4-in (19.05 mm) plywood shelves equally spaced every 18 in (457.2 mm) above the initial shelf. Uniformly load and secure each shelf with not less than 2,000 pounds (907 kg). The load shall remain on each shelf for all drop tests. Close the Tricon doors and center a nominal 4 in (101.6 mm) by 4 in (101.6 mm) piece of lumber under the bottom rail of the door end of the Tricon. Raise the opposite side of the Tricon to a height of 12 in (+3/4, -1/4 in) (304.8 mm (+19.05, -6.35 mm)) and then allow it to fall freely onto a concrete surface using the 4 in (101.6 mm) by 4 in (101.6 mm) piece of timber as a pivot. As a minimum, the Tricon lift height shall be measured at each corner of the Tricon. The same procedures shall be completed for each of the sides of a Tricon; with the raised side always on the side opposite the timber. Lift the entire Tricon 12 in (+3/4, -1/4 in) (304.8 mm (+19.05, -6.35 mm)) and then

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allow the Tricon to fall freely onto a flat concrete surface. Following completion of each individual test, the Tricon and shelves shall be inspected. Permanent deformation, dislocation, damage to, and/or failure of the E-tracks, welds, decking beams, or related components shall be cause for rejection. Nonconformance to 3.3.9 through 3.3.10 shall constitute failure of this test.

4.4.6 Protection and coating adherence test. Coating adhesion shall be verified by ASTM D3359 Method B and MIL-DTL-53072. Nonconformance to 3.2.2 shall constitute failure of this test.

4.4.7 Coating thickness test. Test in accordance with MIL-DTL-53072. Nonconformance to 3.2.2 shall constitute failure of this test.

4.4.8 Shoring slots test. A 50 mm wide (1.9685 in), rigid metal bar is to be inserted in each pair of shoring slot supports so that it runs transversely across the Tricon between the two supports. A load equal to $0.6 P$ is to be distributed across the middle 915 mm (3 ft) of the bar such that the load is applied horizontally towards the Tricon's doors. The doors shall be fully opened during this test. This load shall be maintained on the bar for at least 2 minutes. Nonconformance to 3.3.8 shall constitute failure of this test.

4.4.9 Coupling and lifting test. Three Tricon containers shall be coupled with their supplied connectors in the locked position to form an integral 20-foot (6096 mm) module or container in not more than 30 minutes. A maximum of one forklift truck shall be used to position and assist in the connection of the Tricons to form an ISO equivalent 20-foot (6096 mm) module or container. The 20-foot (6096 mm) module or container shall be loaded as required in 3.5.5 and lifted from the 4 top corner fittings. The four top corner fittings shall be bottom corner fittings as specified in ISO 1161 to permit horizontal coupling between containers (see 3.5.3). The Tricons shall be uncoupled in not more than 30 minutes with one forklift truck after being lifted, and the connecting couplers shall be returned to their original storage area in each Tricon container during the 30 minutes. The lifting test shall be repeated on each individual Tricon container with their loads as required in 3.5.5. Following completion of the coupling and lifting test, the Tricon containers and their connectors shall be inspected. Deflection of the long bottom rail below the surface of the corner fittings of each individual Tricon container shall be measured, and shall not exceed 1 in (25.4 mm). Permanent deformation, dislocation, damage to, and/or failure of the containers and their connectors shall be cause for rejection. Nonconformance to 3.5.5, 3.5.6, and 3.5.9.5 shall also constitute failure of this test.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2).

6. NOTES

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

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6.1 Intended use. The Tricon covered by this specification is intended for the storage, transportation and distribution of dry cargo. These Tricons are based on commercial designs, manufactured using commercial processes, and are modified for military unique requirements for operation in an extreme environment, under conditions typically found in military operations.

6.2 Acquisition requirements. Acquisition documents will specify the following:

- a. Title, number, and date of this publication.
- b. If required, the specific issue of individual documents referenced (see 2.1.1 and 2.3).
- c. When first article testing is required (see 3.1 and 4.2).
- d. When exterior color is other than as specified (see 3.2.2).
- e. When interior color is other than as specified (see 3.2.2).
- f. Optional markings (see 3.6.1).
- g. When Tectyl 121B 2.8 VOC (Daubert Chemical Company) or equivalent undercoating is specified (see 3.2.2).
- h. When decking beams are specified (see 3.3.10).
- i. Packaging requirements (see 5.1).
- j. When locking bar and security seal or cable is specified (see 3.3.7).
- k. When serial numbers are specified (see 3.6.1).
- l. When CARC paint is other than as specified (see 3.2.2).
- m. When opening and closing vents are specified (see 3.3.11).

6.3 First article inspection. When a first article inspection is required, the item(s) should be a first article production unit. The contracting officer should include specific instructions in acquisitions' documents regarding arrangements for examinations, approval of the first article test results, and disposition of the first article(s).

6.4 Corrosion control methods. Corrosion control can be achieved by a combination of design features (as in TACOM Design Guidelines for Prevention of Corrosion in Combat and Tactical Vehicles, March 1988), material selection (e.g. composites, corrosion resistant metal, galvanized steel), organic or inorganic coatings (e.g. zinc phosphate pre-treatment, corrosion resistant plating, E-coat, powder coating) and production techniques (e.g. coil coating, process controls, inspection and documentation). To obtain high level of corrosion resistance/paint adhesion, the manufacturer may want to consider the use of new high performance, "Combat Grade" Powder Coat Primers. These primers can only be applied by approved applicators. The Specification controlling both the primers and their application are available upon request from TACOM - AMSTA-TR-E/MEPS, (586) 574-5083.

6.5 Series E and A vertical tracks. Series E and A vertical tracks are available from, but not limited to, the suggested sources identified below:

ANCRA International, Eastern Region
3300 Turfway Road, Suite 110
Erlanger, KY 48018

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Phone (800) 233-5138
Facsimile (800) 347-2627.

Kinedyne Corporation
3701 Greenway Circle
Lawrence, KS 66046-5442
Point of Contact: Mr. Joe Takacs
Phone (785) 841-4000
Facsimile (785) 841-3668.

6.6 Loop tiedown hooks and web assemblies. Web assembly NSN 3990-01-204-3009 with hooks that meet tiedown interface requirements is available from, but not limited to, the suggested sources identified below:

Davis Aircraft Products Co., Inc.
1150 Walnut Avenue
Bohemia, NY 11716
Phone (631) 563-1500
Facsimile (631) 563-1117

ANCRA International LLC
4880 W. Rosecrans Ave.
Horthorne, CA 90250-6614
Phone (800) 233-5138
Facsimile (859) 371-1103

Kinedyne Corporation
3701 Greenway Circle
Lawrence, KS 66046-5441
Phone (785) 841-4000
Facsimile (785) 841-3668

6.7 Locking bar and security seal or cable. When specified (see 6.2) locking bars with security seals or cables are available from, but not limited to, the suggested sources identified below:

American Seals
P.O. Box 841003
Pembroke Pines, FL 33084
Phone (954) 438-8323
Facsimile (954) 438-8077

PJ Murray Associates, Inc.
P.O. Box 472627
Charlotte, NC 28247

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Phone (704) 844-8600
Facsimile (704) 849-9197

6.8 Disclaimer. Reference herein to any specific commercial company, product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the Department of the Army (DoA), and will not be used for advertising or product endorsement purposes.

6.9 Definitions.

6.9.1 Dissimilar metals. For its purpose, this document considers metals dissimilar when two specimens in contact with each other promote accelerated galvanic corrosion (see 3.2.3).

6.9.2 Recovered materials. For the purpose of this document, recovered materials are those materials that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials (see 3.2.4).

6.9.3 Tricon. A Tricon is a rigid metal container, that 3 are coupled and locked together at their corner fittings form a 19 ft 10.5 in by 8 ft by 8 ft (6058 millimeters (mm) by 2438 mm by 2438 mm) ISO-compatible container. Tricon is an abbreviation of and originates from the words triple and container combined together.

6.9.4 Owner code. The owner code consists of three capital letters of the Latin alphabet such as USA for United States Army, to indicate the owner or principal operator of the container. This code needs to be registered at the Bureau International des Containers in Paris to ensure uniqueness world-wide. The code must be supplied to the contractor by the United States Army.

6.9.5 Serial Number. The serial number consists of 6 (Arabic) numeric digits, assigned by the owner or operator, uniquely identifying the container within that owner/operators fleet.

6.9.6 Check Digit. The check digit consists of one (Arabic) numeric digit that follows the serial number, and provides a means of validating the recording and transmission accuracies of the owner code and serial number.

6.10 Supersession. This specification supersedes purchase description ATPD 2298C, dated 05 March 2010.

6.11 Subject term (key word) listing.

Connecting couplers
Corner fittings
Corner post
End walls
Forklift pockets

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Shoring slot
Side walls

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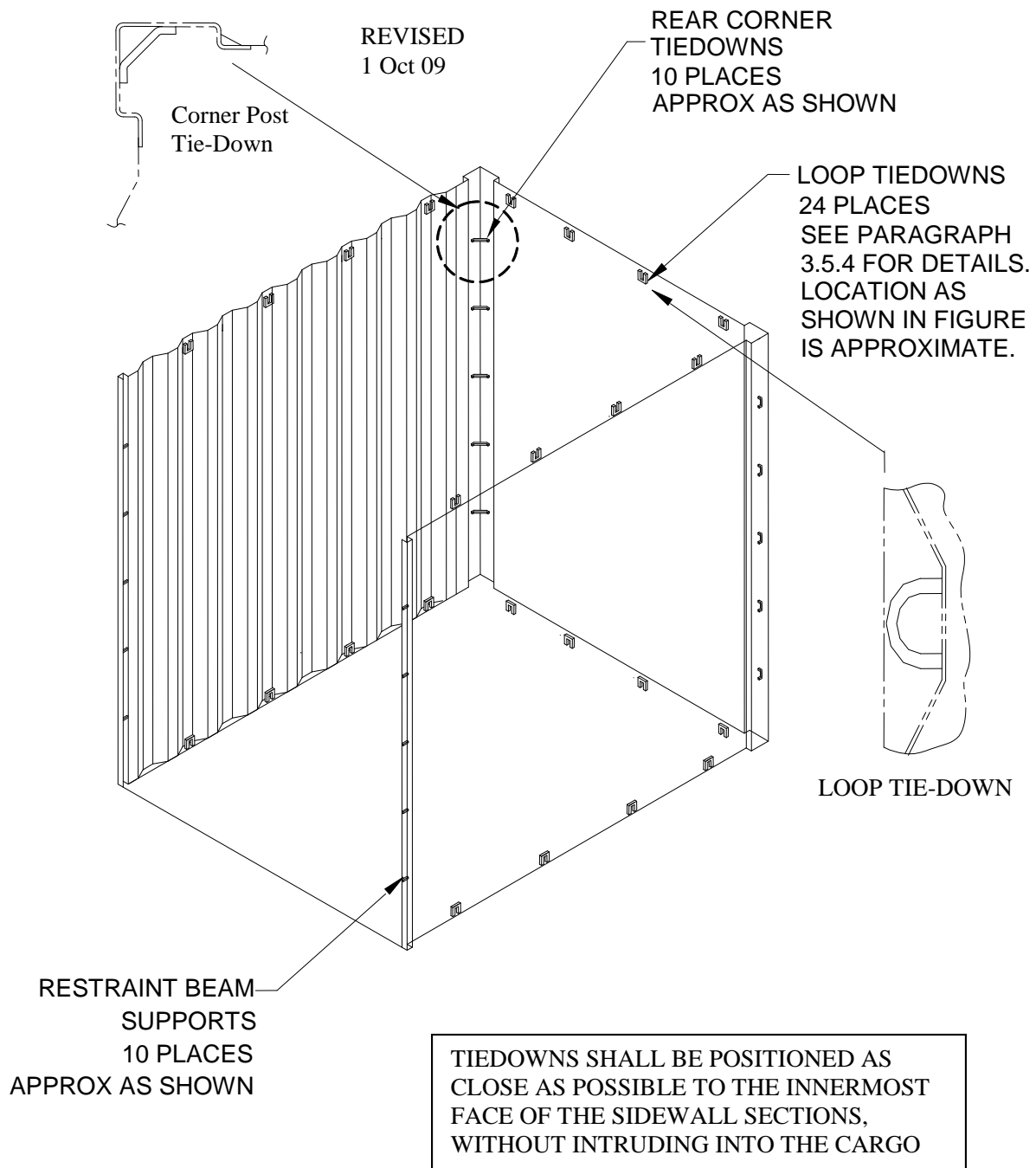
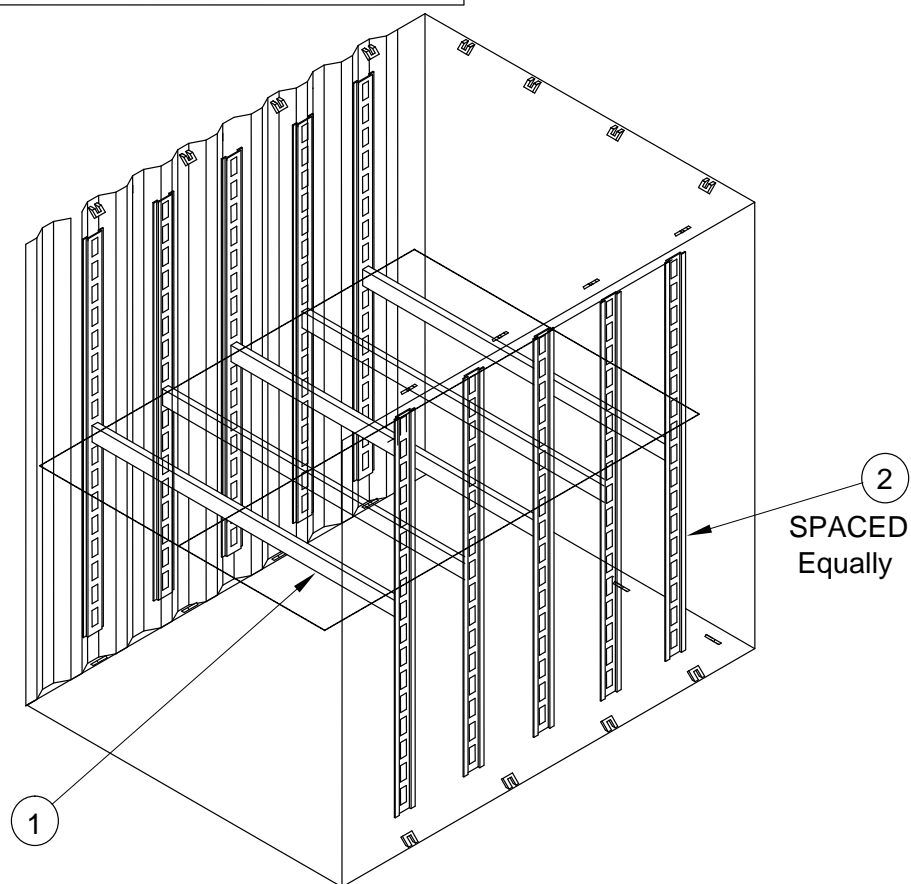


FIGURE 1. Tricon tie-down loop positions for Type I Tricon.

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Table V.

COMPONENTS OF DECKING SYSTEM	
ITEM NO.	DESCRIPTION
1	DECKING BEAM, REMOVABLE
2	VERTICAL INDUSTRY TRACK, 4.0 SOCKET SPACING

FIGURE 2. Tricon shelf decking support system.

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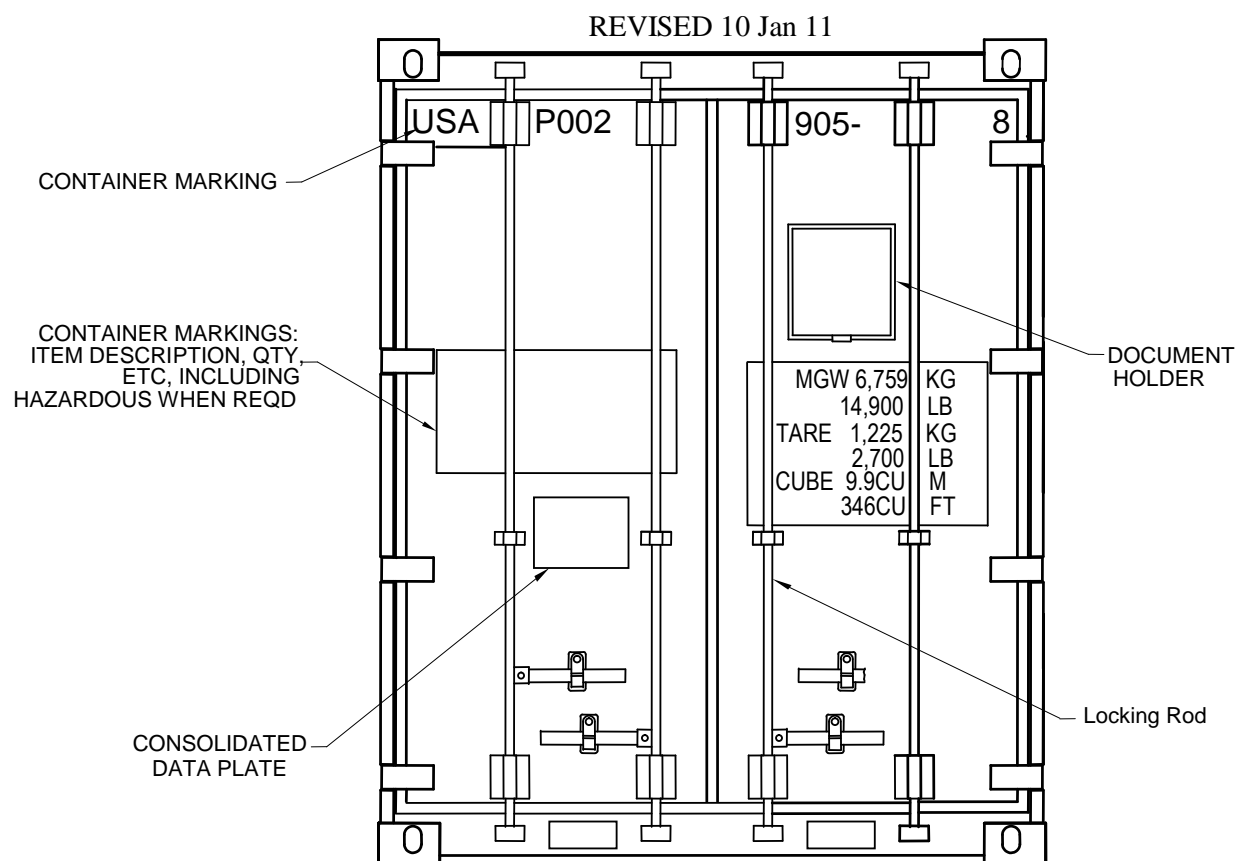


FIGURE 3. Tricon markings example.

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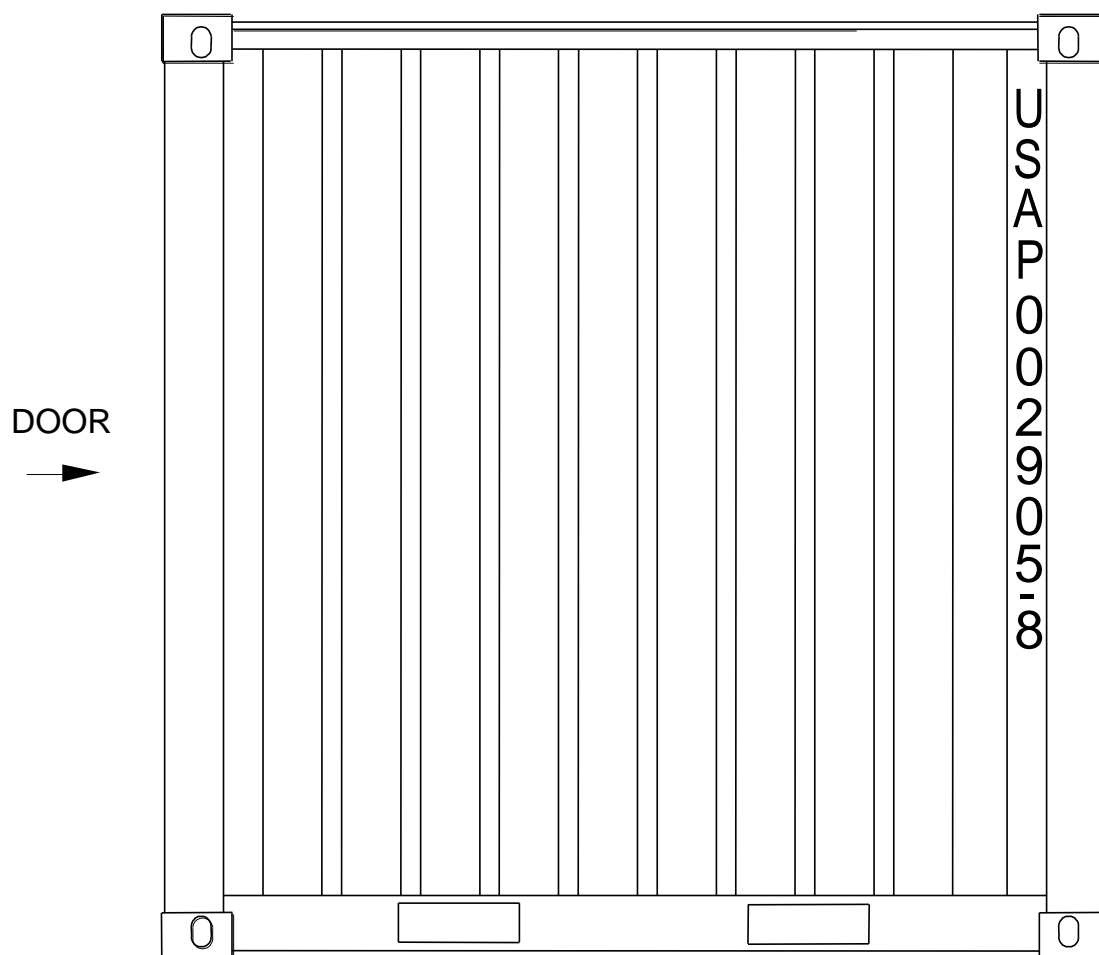


FIGURE 4. Right side view Tricon marking example.

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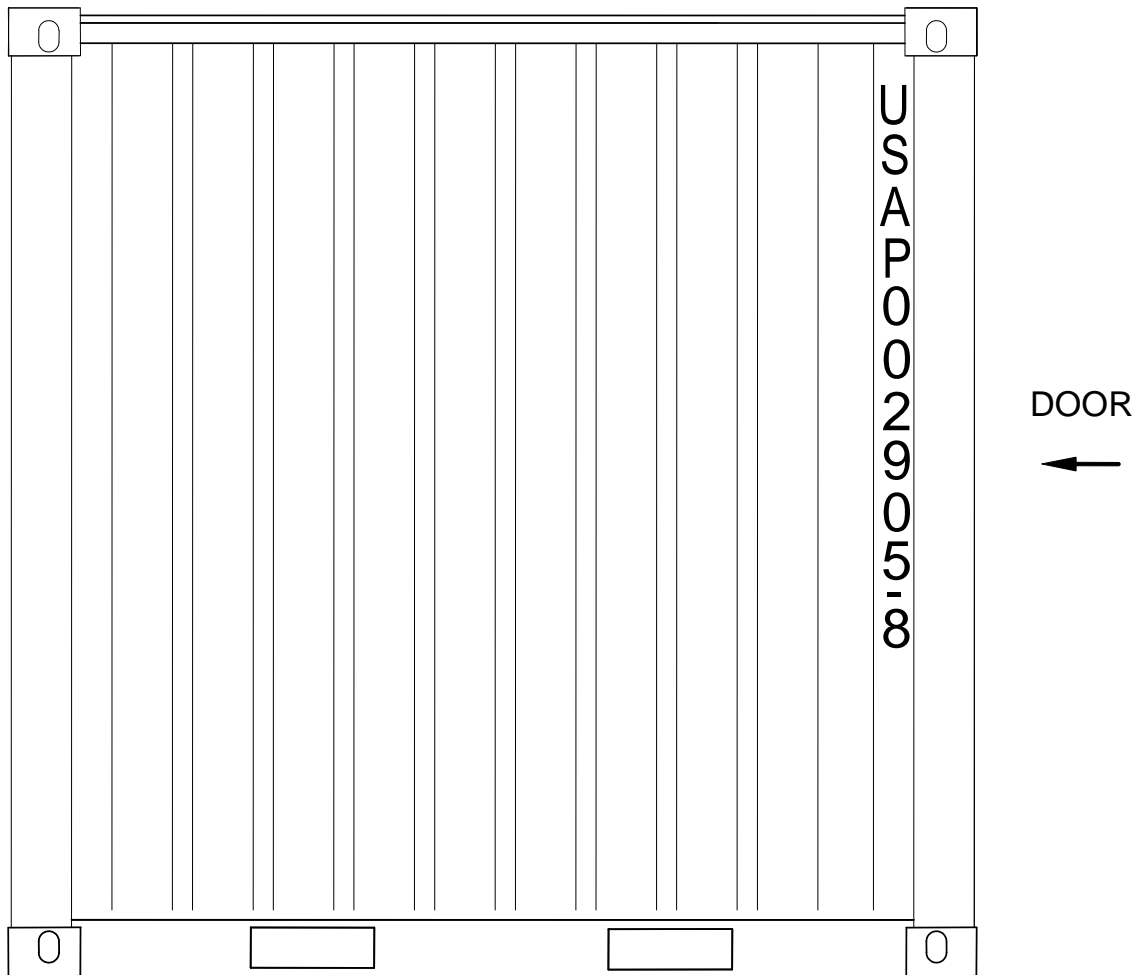


FIGURE 5. Left side view Tricon marking example.

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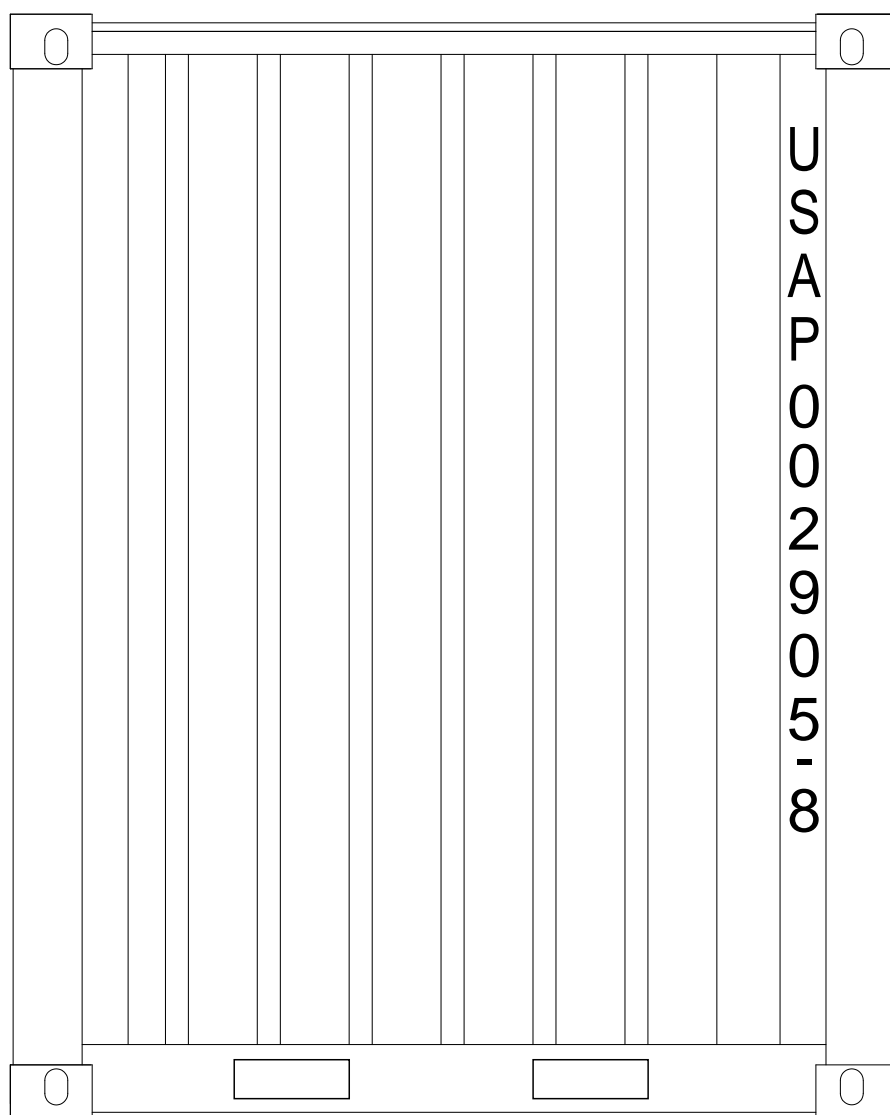
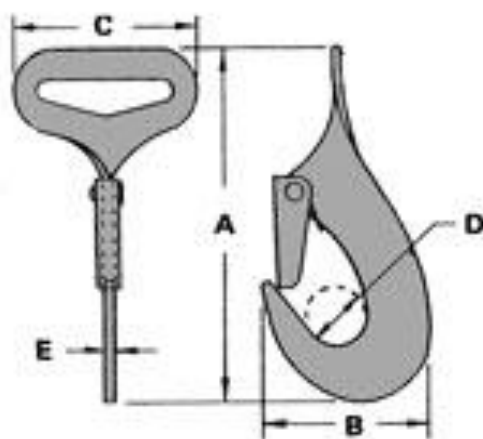


FIGURE 6. Aft wall of Type 1 Tricon; and door end without data plate for Type 2 Tricon marking example.

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Hook Interface Dimensions (in/mm)				
A	B	C	D	E
6.00/152	2.5/63.5	1.50/38.1	0.75/19.1	0.20/5.0

Note: All above dimensions are minimums.

FIGURE 7. Hook Interface Dimensions.

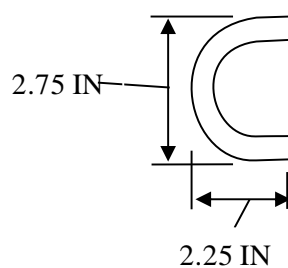


FIGURE 8. Loop tie down formed from 1/2-in (12.7 mm) steel rod.

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Custodians:

Army - AT
Navy - SA
Air Force - 11

Preparing activity:

Army - AT

(Project 8115-2010-002)

Review Activities:

Army - SM, MT
Navy - AS, CG
Air Force - 03, 69
DLA - DH
NGA - MP

Civil Agencies:

GSA - FAS
USDA - FGI

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.daps.dla.mil>.