

MIL-C-52788A(ME)

3 August 1979

SUPERSEDING

MIL-C-52788(ME)

14 May 1974

## MILITARY SPECIFICATION

### CONTAINER, REFRIGERATED:

8 FEET X 8 FEET X 20 FEET, INSULATED

This specification is approved for use by the Mobility Equipment Research and Development Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 This specification covers a 20-foot refrigerated container equipped with a 9,000 Btu per hour electric motor driven refrigeration unit powered by a self-contained 10 kW diesel engine driven generator set or external power source.

#### 2. APPLICABLE DOCUMENTS

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

#### SPECIFICATIONS

##### FEDERAL

L-P-378

P-D-680

- Plastic Sheet and Strip, Polyester

- Dry Cleaning Solvent.

FSC 8115

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Mobility Equipment Research and Development Command, ATTN: DRDME-DS, Fort Belvoir, VA 22060 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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TT-C-520

- Coating Compound, Bituminous, Solvent Type, Underbody (For Motor Vehicles).

TT-E-485

- Enamel, Semi-Gloss, Rust-Inhibiting.

TT-P-664

- Prime Coating, Synthetic, Rust Inhibiting, Lacquer-Resisting.

PPP-B-601

- Boxes, Wood, Cleated-Plywood.

PPP-T-60

- Tape: Packaging, Waterproof.

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MIL-P-116

- Preservation-Packaging, Methods of.

MIL-P-514

- Plates, Identification, Instruction and Marking, Blank.

MIL-T-704

- Treatment and Painting of Materiel.

DOD-P-15328

- Primer (Wash), Pretreatment (Formula 117 for Metals) Metric.

MIL-P-17549

- Plastic Laminates, Fibrous Glass Reinforced, Marine Structural.

MIL-L-21260

- Lubricating Oil, Internal Combustion Engine, Preservative and Break-In.

MIL-G-28554

- Generator Sets, Mobile Electric Power and Supplemental Equipment; Packaging of.

MIL-R-43891

- Refrigeration Unit, Electrical for Insulated Container (Military Van)

MIL-P-46105

- Primer Coating; Weld-Through, Zinc-Rich.

MIL-L-52043

- Lacquer, Semi-Gloss, Cellulose Nitrate

MIL-S-62076

- Semitrailer, Van: Demountable Body (Transmodal Cargo Container)

## STANDARDS

## FEDERAL

FED-STD-H28

- Screw Thread Standards for Federal Services.

FED-STD-595

- Colors.

## MILITARY

MIL-STD-105

- Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129

- Marking for Shipment and Storage.

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MIL-STD-889  
MIL-STD-1188- Dissimilar metals  
- Commercial Packaging of Supplies  
and Equipment.

MIL-STD-1235

- Single and Multilevel Continuous  
Sampling Procedures and Tables for  
Inspection by Attributes.

MIL-STD-1474

- Noise Limits for Army Materiel.

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

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

#### AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

MH5.1 - Basic Requirements for Cargo Containers.  
ISO-790 - Marking of Series 1 Containers.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018).

#### SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE Handbook

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

#### AMERICAN WELDING SOCIETY, INC. (AWS)

D1.1 - Structural Welding Code, Section 5, Qualification

(Application for copies should be addressed to the American Welding Society, Inc., 2501 NW Seventh Street, Miami, FL 33125.)

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ATSM-D1229 - Rubber Property - Compression Set at Low Temperatures,  
Test Method for

(Application for copies should be addressed to the American Society of Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

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AMERICAN BUREAU OF SHIPPING (ABS)

Guide for Certification of Cargo Containers.

(Application for copies should be addressed to the American Bureau of Shipping, 45 Broad Street, New York, NY 10004.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Section IX - Boiler and Pressure Vessel Code, Welding Qualifications.

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.)

DEPARTMENT OF TRANSPORTATION (DOT)

49 CFR 171-190 - Code of Federal Regulations, Title 49.

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

3. REQUIREMENTS

3.1 Description. The container shall be of permanent construction suitable for repeated use for the transportation and storage of cargo requiring controlled temperatures. Unless otherwise specified (see 6.2), the container shall be equipped with a contractor-furnished refrigeration unit conforming to MIL-R-43891 and a Government-furnished 10 kW diesel engine generator set. The refrigeration unit shall meet all requirements of MIL-R-43891 prior to acceptance and installation of the unit on the container for system tests. In addition the refrigeration unit electrical system shall be operable from both 50 and 60 Hz power source, and the thermostat shall be adjustable thru a range of not less than -10° F to +50° F. Meeting the requirements of MIL-R-43891 does not negate the contractor's responsibility of meeting the applicable refrigeration unit portion requirements of this specification.

3.1.1 Terms and definitions. The terms used in this specification shall be as defined in ANSI MH5.1 Information Document "Basic Requirements for Cargo Containers".

3.1.2 Weight, ratings, and dimensions. The weight of the container without the refrigeration unit and engine generator set shall not exceed 6,500 pounds. The gross weight rating for each container shall be 20 long tons or 44,800 pounds. Dimensions, tolerances, and diagonal differences of the container shall meet the requirements for 20-foot nominal length containers

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as specified in ANSI MH5.1, except as specified in Table I. All inside dimensions shall be the maximum attainable, consistent with design and material, but not less than those specified in Table I. Provisions shall be made to acquire International Convention for Safe Container (CSC) approval in accordance with Title 49 of the Code of Federal Regulations. Part 451.1, a CSC marking plate conforming to MIL-P-514, Composition C, shall be provided and mounted on the lower rear end frame member close to the right corner fitting. The plate shall be provided with spaces for stamping retest dates.

3.1.2.1 Tare weight. The tare weight to be marked on the container (see 3.8) shall be the average weight of the first five production containers plus the weight of a 9,000 Btu per hour refrigeration unit plus the weight of a 10 kW diesel engine generator set. The average tare weight of the container shall be compared with the average of the last five containers of the first 50 containers. If the average weight of the last five containers varies more than plus or minus 35 pounds from the average of the first five containers, the average weight of the next five containers (after 50 containers) shall be used as the tare weight. Rechecks and necessary changes shall be made at intervals of 50 containers.

Table I. Dimensions

Inside width, minimum	87 inches
Inside length, minimum	191 inches
Inside height, minimum	83 inches

3.2 First article preproduction container. The contractor shall furnish two containers for examination and test within the time frame specified (see 6.2), to prove that his production methods will produce containers that comply with the requirements of this specification. Examination and tests shall be as specified in Section 4, and unless otherwise specified herein, all examination and tests shall be conducted by the contractor subject to surveillance and approval by the Government (see 6.3). When specified (see 6.2), the Government will conduct any or all of the preproduction examination and tests, as specified.

3.3 First article initial production. When specified (see 6.2), the contractor shall furnish to the Government one or more containers for testing as specified in 4.4.

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3.4 Standard product. Each component, including accessories, instruments, and controls, except military standard items, shall be a current standard catalog product of it's manufacturer except for any modification to meet the specification requirements.

3.5 Materials. Materials shall conform to the applicable specifications and requirements specified herein. Materials not definitely specified shall be of the quality normally used for the purpose by the contractor. Unless otherwise specified herein, commercial tolerance shall apply to material thickness and other dimensions. Nonpermissible galvanic couples (dissimilar metals) as defined in MIL-STD-889, Type II or MIL-T-704 shall be insulated from each other as specified in the appropriate standard or specification.

3.6 Design. The container shall be insulated to conform to the requirements of 3.12.10 and 3.12.11 and shall be equipped with a 9,000 Btu per hour refrigeration unit in accordance with MIL-R-43891. When specified (see 6.2), the refrigeration unit shall be Government-furnished property. The refrigeration unit and 10 kW diesel engine driven generator set shall be mounted at one end of the container. The insulated end wall for mounting the refrigeration unit shall be located a distance of 35 inches measured from the outside face of the corner fitting. Both sides top, bottom and the extreme front of the container near the refrigeration unit shall be open to allow maximum air circulation. Gussets may be installed on the front part of the container frame. Provisions shall be made in the insulated wall of the container for mounting a refrigeration unit as specified in Figure 1. The maximum height of the top front container rail shall be no more than 4 inches. When specified (see 6.2), a 1/2 inch exterior grade plywood coverplate shall be mounted over the refrigeration unit opening. Provisions shall be made in the container floor to mount and secure a 10 kW skid-mounted generator set as shown in Figure 2. The captive nuts shall be secured to withstand the loads imposed during usage of the refrigerated container. Four bolts and lockwashers for securing the generator set shall be provided. The container shall be so constructed that the top of the container floor surface in the generator set area shall not exceed 4.5 inches above the bottom of the container. In addition, provisions shall be made to prevent forward, backward, and vertical movement adjacent to the insulated wall of the generator set by means of heavy duty metal stops welded to the container frame and at the generator set skids without the use of securing bolts near the insulated wall.

3.6.1 Construction. Containers shall be constructed so as to be free of any recesses and voids in which contraband can be concealed or where moisture, dirt and food particles can accumulate. No part of the container shall protrude beyond the outside surfaces of the corner fittings. The yield point of materials shall not be exceeded when the container is tested as specified in 4.6.2. When plywood panel type construction is utilized for sides, ends or top, plywood shall be exterior type protected and reinforced

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on both faces with laminations of glass fiber reinforced polyester resins. Laminates shall conform to MIL-P-17549, Grade W, except that the gel coat on the outer face shall be pigmented as specified in 3.7.4. The outer surface shall be smooth and free of voids except that on the top surface of the container a non-slip material shall be added to the pel coat. All wood members used in the fabrication of the center of walls of the container shall be immersed in wood preservative as specified in 3.7.2.1 for a period of not less than 30 minutes and air dried for a minimum of 24 hours. The inside walls and inside of doors shall be lined with white colored plastic fiberglass. Any wood on the interior and exterior surface of the container shall not be acceptable. The inside ceiling lining material shall be flat fiberglass reinforced plastic. The insulation shall be applied in such a manner as to be closed cell, uniform inconsistency and free of voids. The void space in any panel shall be less than 2.5 percent (see 4.6.2.2.19). Exterior panel sheeting material shall be corrosion-resistant.

3.6.1.1 Side walls and front wall. The exterior side walls and front wall may be of the interior or exterior post type, corrugated, or of smooth skin construction. On all types of construction, lap splices are permitted on metal skin. Provisions shall be made for air flow in the vertical direction at the inside walls. Vertically ribbed or corrugated inside walls shall have a minimum depth of 5/8 inch, having the ribs spaced 16 inches apart.

3.6.1.2 Floor construction. The container floor shall have four drains, one located at each corner. The drains shall be protected by corrosion-resistant screens and have self-closing fittings. Provisions shall be made for air flow in the longitudinal and transverse direction in the floor. A floor with air flow ribs having a minimum depth of 1 1/4 inches shall be provided. The floor shall be either extruded aluminum or fiberglass. If an extruded aluminum floor is used, the door end of the floor shall be reinforced with a metal member welded across the end ribs. The floor of the container shall be leakproof. The top of the floor drains shall be not less than 1/4 inch below the bottom surface of the floor pan (see 4.6.2.2.9.1).

3.6.1.3 Understructure. The container bottom side rails, bottom frame members, and crossmembers shall not deflect below the bottom plane of the bottom corner fittings when loaded to a uniformly distributed load of 44,800 pounds gross weight as specified in 4.6.2.2.15.1. All crossmembers shall be of the same configuration and strength.

3.6.1.4 Roof construction. The roof shall be self-draining. The roof sheet, roof rails, upper end frame members and any fastening devices shall be at least 1/4 inch below the top plane of the top corner fittings.



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**3.6.1.5 End doors.** Two doors shall be hung within the rear end frame and shall provide an opening conforming to the dimensions specified in Table I. The door headers shall be no greater than 4-1/8 inches lower than the inside ceiling location and the door opening shall be not less than 80 inches. Heavy duty pin hinges, recessed within the corner structure shall be provided on each door allowing the door to fold back against the sides of the container. Steel hinges shall have corrosion-resistant steel pins. Each door shall be provided with one or more heavy-duty, handle-operated cam-locking devices with anti-rack provisions. Handles shall be 12 to 18 inches above the bottom plane of the bottom corner fittings. Means shall be provided to hold the doors in the full open position. The doors, when closed, shall be sealed in such a manner as to prevent water entry into the container. The inner seals shall have injection molded corners or heat welded corners to make the inner seals a one piece door seal. The seals shall be mounted to the inner insulation package on the door panels. Inner door seals shall be mechanically fastened with corrosion-resistant fasteners. The container doors shall be constructed in such a manner so that the door seals can be easily accessible for replacement. An adhesive method of securing the inner seals to the door shall not be acceptable. Each guide plate, rod guide, and door hinge shall have a non-galling, antiseizing, corrosion-resistant bushing to provide a smooth bearing surface, ensuring smooth operation of the door locking mechanism. Provision shall be made for air flow in the vertical direction at the inside of the doors. An easy, safe exit from inside the container shall be provided in the last door to be closed in the event someone would be inside of the container and doors would be inadvertently closed and locked. Size of the escape hatch shall be not less than 14 inches by 22 inches rectangular or 18 inches square. TIR (Travel International Regulations, CFR Title 49) requirements shall be met. Personnel exit shall be accomplished without the use of tools within 10 minutes (see 4.6.2.2.21). Door sill shall be designed to prevent damage to container from forklift tines during loading operations.

**3.6.1.6 Corner fittings.** The corner fittings shall conform to dimensional requirements of ANSI MH5.1. The corner fitting shall be constructed of such materials as to enable them to pass the operation and testing requirements as specified herein.

**3.6.1.7 Spacer blocks.** Unless otherwise specified herein, the contractor shall select and provide two spacer blocks for purposes of container design and testing. The spacer blocks shall provide a 3 inch plus 0 minus 1/16 inch spacing between containers when affixed to the top corner fittings. The spacer blocks shall be provided with a hook or other arrangement permitting them to be affixed to the end apertures of the top corner fittings.



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An integral slot or other provision shall be made in the bottoms of the spacer blocks to enable a man standing on the ground, using a pole or other similar item to engage the spacer block hook into the end apertures of the top corner fittings. The material and design of the spacer blocks shall be such as to enable them to pass the operation and testing requirements specified herein. A storage bracket for the spacer block shall be provided in the refrigeration unit area of the container. The bracket shall be located so as to be accessible when the container is mounted on a chassis. When specified (see 6.2), one spacer block shall be delivered with each container.

**3.6.1.8 Anti-pilferage provisions.** No less than 25 percent of the hinges, 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 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 protective coating of the items being welded or of the container parts, the weld and surrounding area shall be thoroughly cleaned and primed with one coat of zinc chromate and at least one coat of finish paint with a dry film thickness of not less than 0.003 inches. All locking device handles shall be furnished with provisions for padlocking and customs sealing.

**3.6.1.9 Fastening devices.** Steel bolts, nuts, screws, and washers shall be zinc or cadmium plated. Threads shall conform to FED-STD-H28. Any steel bolts, nuts, screws, or washers that may come in contact with food products, i.e., those exposed to the interior of the container, shall not be cadmium plated but shall be zinc plated.

**3.6.1.10 Insulation material.** Insulation shall have a commercial manufacturer's K factor of not more than 0.15 British thermal units (Btu) per hour per square foot per inch of thickness per degree Fahrenheit temperature difference at a mean temperature of 75°F. Insulation shall be odor free, fire-retardant and self-extinguishing type. The words "fire-retardant and self-extinguishing" shall be construed to mean that the flame shall extinguish within 60 seconds after removal of the burner. Further, no insulation sample shall burn for a distance greater than 2-1/4 inches from the end exposed to the test flame. No dripping, flaming particles, or droplets shall emit from the samples. Certification of fire retardant characteristics shall be provided.

**3.6.1.11 Temperature Recording System.** A shock-mounted 31-day clock-wound recording thermometer mounted in a weatherproof case having a reading range of -20°F to +60°F shall be provided to record automatically the interior temperature. The recording thermometer shall be mounted on the insulated wall in the refrigeration unit area of the container on the right side and located so as to be accessible and readable when two like

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containers are positioned on a 40 foot highway chassis, front end of one container to back end of the other container. The temperature recording device remote bulb shall be mounted within 2 inches of the inside ceiling of the front insulated wall fully exposed to the refrigerated space and shall be protected to prevent damage from loading and cleaning operations. No less than 20 temperature recording chart sheets for the recorder shall also be provided. A sleeve or other means shall be installed into the container to facilitate the removal and replacement of the temperature recording device remote bulb.

3.6.1.12 Door gasket material. The container door gasket material shall be constructed for satisfactory use (see 4.6.2.2.18) in ambient temperatures of  $-40^{\circ}\text{F}$  to  $+120^{\circ}\text{F}$ . The material shall not exceed a 60 percent set when tested in accordance with ASTM 1229 for 96 hours at  $40^{\circ}\text{F}$ .

3.6.1.13 Auxiliary fuel tank. A diesel auxiliary fuel tank with a volume not less than 30.6 gallons shall be provided. The tank dimensions and location shall allow sufficient space to permit connection to the slave receptacle and 120 VAC power receptacles of the Government furnished generator set secured to the container, and located as shown in Figure 2. The tank design shall include a radial dial type fuel level gage, baffle plates as required, essential pressure relief valves, filler cap, inlet fuel screen, and shall be so designed to prevent fuel spillage when the container is operated on a 40 percent grade forward and backward along the longitudinal axis; and 20 percent side slope on each side. The fuel line fitting shall be a male type, dash 5 size hose fitting, 1/2-20 UNF conforming to SAE J514. A cap for the fuel line fitting shall also be provided. The auxiliary fuel tank shall be bolted to the container frame to facilitate easy removal. Provisions shall be made for storage of the excess length of generator auxiliary fuel line at a place near the auxiliary fuel tank. The fuel line storage volume shall be a minimum of 500 cubic inches.

3.6.1.14 Electric power cable. A four wire electric cable of 5 foot length shall be provided. The cable shall be of a size compatible with a Type I electric connector as specified in ANSI MH5.1. A Type I female electric connector of the ANSI standard type shall also be provided. One end of the cable shall be connected to the electric generator. The cable with connector shall be secured on the container wall above the engine generator set and located on the right side of the container, when facing door end.

3.6.1.15 Engine exhaust line extension. A heavy duty flexible engine exhaust extension shall be furnished to connect to the engine exhaust lines. The exhaust lines shall be positioned as shown in Figure 3. The exhaust line extension outlet shall be straight up in direction and located near the left corner fitting, not less than 7 feet above ground level, and so

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positioned to facilitate correct engine exhaust when two like containers are positioned front end to door end. The exhaust extension shall include a rain cap of the pivot type or other means to shed rainfall. The engine exhaust line extension shall be routed to the left side of the container when facing the container doors and so positioned to allow clearance for a "plug-in" type refrigeration unit with dimensions of 58 in. L x 51 in. H, measured down from the container top, and positioned on the center of the container center vertical axis. The exhaust extension shall be covered with insulation material of sufficient thickness to prevent heat damage to operating personnel and other container parts. The exhaust extension shall be connected to the engine to facilitate installation and removal. The engine exhaust location shall be as shown in Figure 3. The exhaust lines shall be made of stainless steel material. The lines shall be securely fastened in the operating mode against the front insulated wall.

A nominal 1 inch air space between the insulated wall and the pipes shall be maintained. The exhaust system shall be sufficiently strong to guard against surface movement, vibrations, and all other requirements of this specification. The clamps for securing the exhaust pipes to the generator set shall be provided. The exhaust lines shall be constructed to create a back pressure of not more than 2 inches of water peak measured at the muffler discharge.

**3.6.1.16 Seagoing requirements.** The container shall be designed to meet seagoing specifications of the American Bureau of Shipping. Aluminum components shall be treated to resist salt spray.

**3.6.1.17 General maintenance requirements.** When compatible with requirements as specified in 3.6 the container design shall facilitate service and maintenance of refrigeration and power equipment as a single unit.

**3.6.1.18 Interior lighting.** The container shall be equipped with an interior lighting system. The electric characteristics of the system shall be compatible with the container refrigeration unit and generator set. The lights shall be operable when the container is operating from either the generator set or external power. One light fixture equipped with a minimum of 100 watt bulb shall be provided. The fixture shall be positioned at the end doors. The location shall be near the inside container ceiling. A manually operated light switch shall be located near the light bulb and located on the right-hand side and near the ceiling. Provisions shall be made to connect the container lighting system to the container generator set and to the external power source. Guards or other means shall be provided to protect the lighting system from shifting cargo.

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3.6.1.19 Noise level. The container, operating from electric standby power, shall meet the requirements of Category D (85 dB(A)) of MIL-STD-1474 (see 4.6.2.2.20). The distance at which the container exceeds 85db(A) when operating from the generator shall be determined. A sign shall be provided meeting the requirements of Figure 4 of MIL-STD-1474 stating "Caution hearing protection required within        feet when operating generators"

### 3.7 Treating and painting.

3.7.1 Cleaning and treatment. Cleaning and treatment shall be in accordance with MIL-T-704. Surfaces to be welded which have not been cleaned, treated and painted prior to assembly and which are inaccessible for cleaning, treating, and painting after welding shall be cleaned and coated with primer coating conforming to MIL-P-46105 to a minimum dry thickness of 0.0015 inch prior to welding. Other surfaces which are inaccessible after assembly shall be cleaned, treated and painted as specified herein prior to assembly or cleaned and coated as specified for inaccessible welded surfaces prior to assembly. Hermetically sealed areas will not require any protection. After cleaning and treatment, all exposed exterior metal surfaces shall be painted with enamel conforming to TT-E-485, Type II or IV, color 24087 of FED-STD-595. Where a lacquer paint system is provided all exposed metal exterior surfaces shall be pretreated after cleaning with a wash-primer conforming to MIL-P-15328, primed with a primer conforming to TT-P-664 and finished painted with a lacquer coating conforming to MIL-L-52043. The finish coating color shall be color 24087 of FED-STD-595. The minimum thickness of the dry paint film shall be 0.003 inches. This thickness may be achieved in one or more coats. The interior of the container shall be white.

3.7.2 Wood surfaces. All wood surfaces shall be cleaned of all dirt, grease, oil, and other deleterious substances before preservation treatment.

3.7.2.1 Interior wood. Wood used for interior framing shall be treated in accordance with P-D-680, Type II, and shall contain 1 percent solubilized copper-8-quinolinolate free of amines and naphenic acid or its derivative.

3.7.3 Undercoating. The underside of the container floor shall be coated after painting with a 1/16 inch bituminous coating conforming to TT-C-520. Overrun into the cross members, corner fittings, side rails, and end frame members is permitted.

3.7.4 Plastics. Plastics used in exterior applications shall be pigmented and finished to produce a color conforming to 24087 or 14087 of FED-STD-595.

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**3.8 Exterior marking.** Exterior marking of the container shall conform to ISO 790 with the following additional requirements:

- (a) The owners identification code and the unit serial number (see 6.2), shall be stencilled in characters not less than 4 inches high and of proportional width and thickness, at a central location on the container. The characters shall run in sequence from the front to the rear of the container.
- (b) The maximum net cargo weight in pounds and kilograms shall be stencilled in characters not less than 2 inches proportional width and thickness on the left hand door of the container.
- (c) The longitudinal center of balance of the empty container equipped with a refrigeration unit and an engine generator set shall be marked on both sides of the container with a 4 inch high vertical arrow and letters 2 inches high.
- (d) "Retain generator power connector cable at all times" shall be stencilled above the cable (see 3.6.1.14).
- (e) "DIESEL FUEL ONLY" shall be stencilled on the auxiliary fuel tank (see 3.6.1.13).
- (f) "DO NOT FILL ABOVE THIS LINE" shall be stencilled in white lettering on the auxiliary fuel tank. Two horizontal white lines, one on each side, not less than 10 inches long and 1 inch wide shall also be stencilled on the tank and located 2 inches below the bottom of the tank neck (see 3.6.1.13).
- (g) "Manual Holder" shall be stencilled on the manual holder in white lettering 1/2 inch high (see 3.11.1).
- (h) "Caution: Do not handle container with forklift tines" shall be stencilled on each side of the container on the bottom frame under the center of balance marker in four inch high yellow lettering.
- (i) Any other safety markings required to warn personnel concerning concealed safety hazards such as belts which have not been equipped with guards due to remoteness from operator.

**3.9 Interior marking.** The owners identification code and the container serial number shall be stamped or stencilled in characters at least 1/2 inch high on an interior surface of the rear upper left corner. The number shall be located within an area 18 inches from the left vertical end frame member where it will not be obscured. The following will be stencilled in 1 inch high black lettering on the interior surface under the evaporation exit:

"WARNING: DO NOT BLOCK AIR CIRCULATION."

**3.10 Data plates.** Nonferrous metal data plates conforming to MIL-P-514 Type I, Style 3, Composition A class 1 or Composition C material shall be affixed to the center of the external surface of the right hand door. The method

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of attachment shall be by either riveting or bolting. The data plate shall contain the following information:

U.S. Container, Refrigerated  
 Specification: \_\_\_\_\_  
 FSN: \_\_\_\_\_  
 Serial Number: \_\_\_\_\_  
 Tare Weight, Equipped: LBS \_\_\_\_\_ KG \_\_\_\_\_  
 Contract Number: \_\_\_\_\_  
 MFD By: \_\_\_\_\_  
 Date (Month & Year) \_\_\_\_\_  
 Technical Manual \_\_\_\_\_

3.11 Document holder. One waterproof, metal documentation box shall be securely fastened to the inside of the right door of each container. The closing and latching devices of the box shall be capable of repeated opening and closing, without tools and without impairing their sealing quality. The inside dimensions of the box shall be 9 x 12 x 2 inches minimum. The box shall be stencilled "Document Holder" in white lettering 1-inch high.

3.11.1 Manual holder. One waterproof, metal manual holder shall be securely fastened to the outside of the front insulated wall of the container, 24 inches from the top and 12 inches from the right wall. The closing and latching devices of the box shall be capable of repeated opening and closing, without tools and without impairing their sealing quality. The inside dimensions of the box shall be 9 x 12 x 3 inches minimum.

3.12 Performance. The container shall meet the following requirements when tested as specified in 4.6.2. Structural loading conditions shall be met without depending on the structural integrity of the refrigeration unit or the engine generator set.

3.12.1 Stacking. The container, loaded to a gross weight of 1.8 times its rated maximum gross weight (80,640 pounds), shall withstand without damage or permanent deformation the loads imposed on its four corner posts when five 20-foot standard containers, each loaded to 1.8 times its maximum gross weight (80,640 pounds), are stacked on top of it. The containers shall be stacked within overall limits of eccentricity of 1 inch laterally and 1-1/2 inch longitudinally (see 4.6.2.2.1).

3.12.1 Lifting from top. The container, uniformly loaded to a gross weight of 2.0 times its rated maximum gross weight (89,600 pounds) shall be capable of being lifted vertically from the top four corner fittings without damage or permanent deformation (see 4.6.2.2.2).



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3.12.3 Lifting from the bottom. The container, loaded as specified in 3.12.2, shall be capable of being lifted from the bottom four corner fittings when the lifting forces are applied at an angle of not less than 30 degrees from the horizontal without damage or permanent deformation (see 4.6.2.2.3).

3.12.4 Restraint. The container, loaded to its rated maximum gross weight (44,800 pounds) shall withstand without damage or permanent deformation 2.5 G's external restraint applied in a horizontal plane in the longitudinal direction (see 4.6.2.2.4).

3.12.5 Floor. The floor of the container shall withstand without damage or permanent deformation a load of not less than twice the maximum payload when 60 percent of the payload is uniformly distributed over the longitudinal center 10 feet of the floor with the balance of the load uniformly distributed over the remainder of the floor. The floor shall also withstand without damage or permanent deformation the dynamic loads imposed by an industrial materials handling vehicle with a wheel load of at least 6,000 pounds per wheel, wheel centers 30 inches apart, wheel width of not less than 7 inches, and a contact area not greater than 22 square inches per wheel (see 4.6.2.2.8).

3.12.6 Roof. The container roof shall withstand without damage or permanent deformation a load of 660 pounds uniformly distributed over an area 12 inches by 24 inches (see 4.6.2.2.7).

3.12.7 Walls. Each end wall of the container shall withstand without damage or permanent deformation a uniformly distributed load of not less than 0.4 times the maximum payload of a 20-foot container. Each side wall shall withstand without damage or permanent deformation a uniformly distributed load of 0.6 times the maximum payload for a 20-foot container (see 4.6.2.2.5 and 4.6.2.2.6).

3.12.8 Racking. The container shall withstand a lateral and longitudinal concentrated load of 33,600 pounds applied for 5 minutes to each of the four top corner fittings when the bottom corner fittings are firmly anchored. Permanent deformation with the dimensional tolerances shall be permitted provided there is no functional failure.

3.12.9 Weatherproofing. When tested as specified in 4.6.2.2.9, the container shall show no signs of leakage.

3.12.10 Heat transfer. The heat transfer of the container equipped with a 9,000 Btu per hour refrigeration unit installed (see 3.13) shall not exceed 44 Btu per hour per degree F with a mean wall temperature of 50°F; or 48 Btu per hour per degree F with a mean wall temperature of 100°F when tested as specified in 4.6.2.2.11.



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3.12.11 Air leakage. The air leakage of the container equipped with a 9,000 Btu per hour refrigeration unit shall not exceed 5.0 cubic feet per minute at an air pressure differential of 0.25 inches of water gage without external air movement (see 4.6.2.2.12).

3.12.12 Pull down. When tested as specified in 4.6.2.2.13, the container equipped with a 9,000 Btu per hour refrigeration unit and operated in an ambient temperature of 100°F shall reduce the interior of the container from 100°F to 0°F in not more than 4 hours without overloading the Government-loaned 10 kW diesel engine generator set or the compressor electric motor (see 3.13).

3.12.13 Heat dissipation, container positioned front end to door end with a like container. The container will be so constructed that when two like containers are positioned front end to door end and 54 inches above ground, movement of air around and through the refrigeration unit and generator set located near the contacting containers shall be sufficient to allow sufficient heat rejection to reduce the temperature of the interior of the container from 100°F to 0°F in no more than 5 hours when operating in an ambient temperature of 100°F. Power to operate the refrigeration unit shall be utilized from the container engine generator set (see 4.6.2.2.14).

3.12.14 Chassis compatibility. The containers shall be capable of being transported on a chassis conforming to MIL-S-62076, Type 2 in the 20-foot single configuration when loaded to the maximum container gross weight, and in the 40-foot paired configuration when loaded to a gross vehicle weight of 62,000 pounds for the two containers and two chassis. The container shall be secured to the chassis frame by means of twist lock devices provided at each corner of the frame. In the 40-foot paired chassis container configuration, the containers shall withstand the compressive forces transmitted through the upper roof rails and corner fittings during operation (see 4.6.2.2.15).

### 3.12.15 Maintainability

3.12.15.1 Maintenance ratio. The containers shall have a maintenance ratio of not more than 0.11. Maintenance ratio is defined as the ratio of the total active maintenance man-hours required (scheduled and unscheduled), of the total operative time of the system. Man-hours scheduled before and after operation checks are excluded. The breakout of major components shall be as follows: Refrigeration unit .04 and container 0.015. The Government-furnished generator set shall be assumed to be 0.055. A maintenance schedule shall be furnished prior to the start of any testing. The mean time to repair shall not exceed 1 hour for organizational maintenance and 3 hours for direct support maintenance.

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**3.12.15.2 Ease of maintenance.** All assemblies and installed attachments shall be accessible for preventive maintenance actions without requiring the removal of other major assemblies and installed attachments not normally removed. Provisions shall be made for drainage of all fluids of the container system either to the ground or an appropriate receptacle. Integral tubes, hoses, or troughs may be used to convey the fluids from the drain outlet. The drain outlets for the engine lubrication system shall provide complete drainage of the system when in a level position.

**3.12.16 Reliability.** The specified Mean-Time-Between-Failure (MTBF) shall be 400 hours when the containers are tested as specified in 4.6.2.2.17. The MTBF of the supplier-furnished refrigerator unit and container portion of the system shall be 560 hours (see 6.6).

**3.13 Government-loaned property.** When specified, the following property in the quantities indicated will be loaned by the Government (see 6.5):

<u>Item No.</u>	<u>Description</u>	<u>Identification</u>	<u>Quantity</u>
1	9,000 Btu per hour refrigeration unit for insulated containers	MIL-R-43891	2
2	10 kW diesel engine generator set	FSN 6115-00-465-1030	2
3	Chassis coupleable: semitrailer, van	MIL-S-62076, Type 2	2

**3.13.1 Government-furnished property.** Unless otherwise specified (see 3.1), one 10 kW diesel engine generator set, NSN 6115-00-465-1030 will be furnished by the Government for installation on each container.

**3.14 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 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 the cargo. The interior of the container shall be cleared and cleaned of any excess building material.

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3.14.1 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 and 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.

3.14.2 Fiberglass. Fiberglass or fiberglass coated plywood used in the fabrication of the container shall be smooth and free from bubbles, glazing cracks, and discontinuities. All edges of fiberglass reinforced plywood shall be completely sealed to prevent water intrusion between the laminates.

3.14.3 Bolted and riveted connectors. 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 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 rivet, concentric with the rivet holes, and in full contact with the surface of the members.

#### 3.14.4 Welders and welding

3.14.4.1 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 has passed qualification tests as prescribed by either of the following listed codes for the type of welding operations to be performed and that such qualification is effective as defined by the particular code:

D1.1 - Structural Welding Code, Section 5, Qualification of the AWS.  
Welding Qualifications of the ASME.

3.14.4.2 Welding. The surfaces of parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. 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.

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

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

3.15 Steps. A ladder with 12 inch long steps shall be located between the top and bottom container side frame rails and on the left side of the container. The ladder shall be located in front of the front insulated wall. All steps shall be sufficiently strong to hold a 600 pound weight and the distance between each step shall be a maximum of 12 inches. In addition, a swing down type step ladder shall be provided with a step height of not more than 30 inches above ground level. In the use position, the swing type ladder shall be constrained to prevent lateral and longitudinal movement. A heavy duty positive lock shall be provided to secure the swing ladder mechanism in the store position. The ladder shall be located a minimum of 11 inches from the front insulated wall to allow for battery removal. The ladder steps shall be treated with abrasive material to prevent slipping or shall be designed with a serrated surface.

#### 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 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 assure supplies and services conform to prescribed requirements.

4.1.1 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards.

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

- (a) First Article preproduction inspection (see 4.3).
- (b) First-Article Initial production inspection (see 4.4).
- (c) Quality conformance inspection (see 4.5).
- (d) Inspection comparison (see 4.7).
- (e) Inspection of packaging (see 4.8).

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#### 4.3 First-Article preproduction inspection.

4.3.1 In-process inspection. Two of the first containers produced shall receive an in-process inspection by the contractor under the direction and surveillance of the Government. This inspection shall be conducted to evaluate materials and workmanship as specified in 3.5 and 3.14. Nonconformance to 3.5 or 3.14 shall be cause for rejection.

4.3.2 Examination. The two containers shall be examined as specified in 4.6.1. Presence of one or more defects in either container shall be cause for rejection of both containers.

4.3.3 Tests. The two containers shall be tested as specified in 4.6.2 through 4.6.2.2.22 except 4.6.2.2.17. Tests specified for paired containers shall be made on those two containers. Tests specified for single containers shall be performed on both containers. Failure on any test shall be cause for rejection of both containers.

4.4 First Article Initial production inspection. When specified (see 3.3), one or more initial production containers will be selected at random by the Government from those being produced from production tooling and will be examined as specified in 4.6.1 and tested as specified in 4.6.2.2.13, 4.6.2.2.16 and 4.6.2.2.17 to determine conformance to the requirements of this specification. The inspection will be performed by the Government at a site selected by the Government. Acceptance of the initial production containers shall not exclude the remaining containers from the quality conformance inspection and acceptance provisions specified in Section 4. In addition to any test specified as part of the initial production test, the Government reserves the right to conduct any and all other tests contained in this specification as part of the initial production test and failure of such additional test shall have the same effect as failure of those tests specified as initial production tests.

4.4.1 Inspection failure. Failure of any initial production container to meet any requirement specified herein during and as a result of the examination and tests specified in 4.4 shall be cause for rejection of the initial production containers and shall be cause for refusal by the Government to continue acceptance of production containers until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies. Correction of such deficiencies shall be accomplished by the contractor at no cost to the Government on containers previously accepted and produced under the contract. Any deficiencies found as a result of the initial production inspection will be considered prima facie evidence that all containers accepted prior to the completion of initial production testing are similarly deficient unless evidence to the contrary is furnished by the contractor and such evidence is acceptable to the contracting officer.

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4.5 Quality conformance accept inspection

4.5.1 Sampling. Sampling for container inspection shall be in accordance with MIL-STD-105, Level II with the lot the weekly production quantity. Sampling for container testing shall be in accordance with MIL-STD-105, Level SI with the lot being the monthly production quantity. Sampling and examination of refrigeration units shall be in accordance with MIL-R-43891.

4.5.2 Examination.

4.5.2.1 Individual. Each container shall be examined for correct identification as specified in 3.8. Presence of incorrect identification shall be cause for rejection.

4.5.2.2 Samples. Samples selected in accordance with 4.5.1 shall be examined as specified in 4.6.1. AQL shall be 2.5 percent defective for major defects and 10 percent defective for minor defects.

4.5.3 Test. Samples selected in accordance with 4.5.1 shall be tested for weatherproofness in accordance with 4.6.2.2.9 before application of finish painting or undercoating or installation of insulation and liner. AQL shall be 6.5 percent defective.

4.6 Inspection procedure

4.6.1 Examination. The containers shall be examined as specified herein, for the characteristics listed in Table II.

TABLE II - EXAMINATION SCHEDULE

NUMBER	CHARACTERISTIC	REQUIREMENT PARAGRAPH
101	Dimensions not as specified.	3.1.2
102	Weight and ratings not as specified	3.1.2
103	Tare weight not marked on the containers as specified	3.1.2.1
104	Materials not as specified	3.5
105	Basic requirements as to design not as specified.	3.6.6
106	Basic requirements as to construction not as specified.	3.6.1
107	Side walls and front wall not constructed as specified.	3.6.1.1

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TABLE II - EXAMINATION SCHEDULE con't

NUMBER	CHARACTERISTIC	REQUIREMENT PARAGRAPH
<b>MAJOR</b>		
108	Floor construction not as specified.	3.6.1.2
109	Under structure not as specified.	3.6.1.3
110	Roof construction not as specified.	3.6.1.4
111	End doors not constructed as specified.	3.6.1.5
112	Corner fittings not as specified.	3.6.1.6
113	Spacer blocks not furnished as specified.	3.6.1.7
114	Anti-pilferage provisions not furnished as specified.	3.6.1.8
115	Fastening devices not as specified.	3.6.1.9
116	Insulation material not as specified.	3.6.1.10
117	Temperature Recording System not furnished as specified.	3.6.1.11
118	Door gasket material not furnished as specified.	3.6.1.12
119	Auxilliary fuel tank not furnished as specified.	3.6.1.13
120	Electric power cable not furnished as specified.	3.6.1.14
121	Engine exhaust line extension not furnished as specified.	3.6.1.15
122	Interior lighting system not furnished as specified.	3.6.1.18
123	Metal fabracation not as specified.	3.14.1
124	Fiberglass not as specified.	3.14.2
125	Bolted or riveted connections not made as specified.	3.14.3
126	Welders not certified as specified	3.14.4.1
127	Welding not as specified.	3.14.4.2
128	Machine work not as specified.	3.14.5
129	Castings not as specified.	3.14.6
130	Ladder not furnished as specified.	3.15
201	Cleaning and treatment not as specified.	3.7.1
202	Cleaning of wood surfaces not as specified.	3.7.2
203	Interior wood for interior framing not treated as specified.	3.7.2.1
204	Undercoating not as specified.	3.7.3
205	Plastics used in exterior applications not pigmented and finished to produce a color conforming to 24087 or 14087 of FED-STD-595 as specified	3.7.4
207	Interior marking not as specified.	3.9
208	Data plates not as specified.	3.10
209	Document holder not manufactured as specified.	3.11
210	Manual holder not manufactured as specified.	3.11.1
211	Workmanship not as specified.	3.14



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## 4.6.2 Tests

4.6.2.1 Test conditions. Tests for weatherproofness in accordance with 4.6.2.2.9 shall be made after completion of all other tests. The test load within the container shall be uniformly distributed, except as otherwise specified herein. Test loads may be precooled to avoid delay in testing. On completion of each test, the container shall be examined to determine compliance with the performance requirements specified in 3.12. During tests, tare weight of container is the empty weight of container equipped with refrigeration unit and engine generator set. When the contractor is not required to provide a refrigeration unit and mount the Government-furnished generator set, as a part of the container, these items will be loaned by the Government and installed by the contractor for required testing. When the contractor is required to furnish the refrigeration unit qualification inspection in accordance with MIL-R-43891 shall be completed prior to commencing system tests.

### 4.6.2.2 Test procedures

4.6.2.2.1 Stacking. The container under test shall be placed on four level pads, one under each bottom corner fitting. The pads shall be centered under the fittings and shall be the same plan dimensions as the fittings. The container shall be uniformly loaded to a gross weight of 80,640 pounds. Five standard 20-foot containers, each uniformly loaded to a gross weight of 80,640 pounds, shall be stacked on top of the container under test. The five containers shall be stacked flush in relation to each other, but shall be offset with respect to the container under test by 1 inch laterally and 1-1/2 inch longitudinally. The five containers shall remain in place not less than 5 minutes. The test shall then be repeated with the five containers offset longitudinally in the opposite direction.

4.6.2.2.1.1 Alternate stacking. In lieu of the procedure outlined in 4.6.2.2.1, the container under test, loaded, and placed as specified in 4.6.2.2.1, may be subjected to a load of 403,200 pounds. The load shall be applied through the centers of four pads of the same plan area as the corner fittings and shall be equally divided among the four corner fittings. Each pad shall be offset in the same direction by 1 inch laterally and 1-1/2 inch longitudinally. The load shall be applied for not less than 5 minutes. The test shall then be repeated with pads offset longitudinally in the opposite direction.

4.6.2.2.1.2 Alternate individual corner structures. In lieu of the procedure outlined in 4.6.2.2.1 and 4.6.2.2.1.1, all corner structures may be test loaded individually to 100,800 pounds. The container shall be loaded to a gross weight of 80,640 pounds. The test shall be made on a container, placed on pads as specified in 4.6.2.2.1. The load shall be applied through the center of a rigid pad of the same dimensions as the corner fittings. The pad shall be offset from the corner fitting 1 inch laterally and 1-1/2

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inch longitudinally. (Direction of offset shall be changed so that in testing two containers each possible offset is applied to one rear and to one front corner fitting.) The load shall be applied for not less than 5 minutes. No side or end supports for the container shall be used in this test.

4.6.2.2.1.3 Failure criteria. Nonconformance to 3.12.1 shall constitute failure of any stacking test used.

4.6.2.2.2 Lifting from the top. The container under test shall be loaded to a gross weight of 89,600 pounds. The container shall be lifted by all four top corner fittings in such a way that no noticeable acceleration or deceleration forces are applied. The lifting force shall be applied vertically. The container shall be lifted until clear of the supporting surface and suspended for not less than 5 minutes. Nonconformance to 3.12.2 shall constitute failure of this test.

4.6.2.2.3 Lifting from the bottom. The container under test shall be loaded to a gross weight of 89,600 pounds. The container shall be carefully lifted by all four bottom corner fittings in such a way that no noticeable acceleration or deceleration forces are applied. The lifting force shall be applied using one spreader above the roof. The angle of the lifting force shall be 30 degrees from the horizontal. Lifting shall be performed in such a way that the lifting cables do not bear against the container sides. The line of action of the lifting cables and the outer face of the corner fitting shall be parallel and no farther apart than 1-1/2 inches. The containers shall be lifted until clear of the supporting surfaces and suspended for not less than 5 minutes. Nonconformance to 3.12.3 shall constitute failure of this test.

4.6.2.2.4 Restraint. The container under test loaded to gross weight of 44,800 pounds shall be restrained longitudinally by securing the bottom corner fittings at one end to suitable anchor points through the bottom apertures. A force equal to 112,000 pounds shall be applied longitudinally to the container through the end apertures of the bottom corner fittings at the opposite end, first in compression and then in tension, for not less than 5 minutes each. (A force of 56,000 pounds in tension or compression shall be borne by each lower corner fitting and its connection to the container structure). When the second container is tested, it shall be anchored at the end opposite to the end anchored in the test of the first container. Nonconformance to 3.12.4 shall constitute failure of this test.

4.6.2.2.5 End wall strength. A 20-foot container shall be loaded with a weight equal to 0.4 times the maximum container payload (44,800 pounds less the tare weight of the container). (Water or air shall be used for the test load). The container, with the end to be tested facing down, shall be

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supported on two level pads placed under the end faces of the two bottom corner fittings. The container shall be held in this position by restraining devices attached to the bottom corner fittings at the opposite end. The supporting pads shall be of sufficient thickness to allow the ends of the container to cantilever freely in space when loaded as specified. Structural members and panels not under test may be supported during this test. The load shall be applied to the full cross-section of the end wall, and shall be uniformly distributed. Tests shall be made on both the front end and on the rear (door) end. The load shall remain in place for not less than 5 minutes. A test on the doors and door frame not attached to a container is not an acceptable substitute for the specified test on the door end. The refrigeration unit and generator set shall not be installed in the container during wall strength tests. Nonconformance to 3.12.7 shall constitute failure of this test. It is not necessary to stand the container on end when air testing.

4.6.2.2.6 Side wall strength. Each container shall have one side wall tested when both sides are identical. If the two side walls are not the same, both shall be tested. The container shall be loaded to 0.6 times its maximum payload. (Water or air shall be used for the test load). The container, with the side to be tested facing down, shall be supported on two level pads placed under the side faces of the two bottom corner fittings. The container shall be held in this position by restraining devices attached to the bottom corner fittings at the opposite side. The supporting pads shall be of sufficient thickness to allow the sides of the container to cantilever freely in space when loaded as specified. The load shall be applied to the full cross section of the side wall and shall be uniformly distributed. The roof may be supported during this test. The load shall remain in place for not less than 5 minutes. Nonconformance to 3.12.7 shall constitute failure of this test. It is not necessary to stand the container on end when air testing.

4.6.2.2.7 Roof strength. A load of 660 pounds shall be uniformly distributed over an area of 24 inches by 12 inches located with the 12 inch dimension parallel to the longitudinal axis of the container, between roof supporting cross-members, and as nearly as possible equally distant between front and rear and between the sides of a 20-foot container. The load shall remain in place for not less than 5 minutes. Nonconformance to 3.12.6 shall constitute failure of this test.

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4.6.2.2.8 Floor strength. Rest the container on its four bottom corner fittings, with the intermediate structure a minimum of 1 inch above the supporting surface and free to deflect. Then test as specified in 4.6.2.2.8.1 and 4.6.2.2.8.2.

4.6.2.2.8.1 Dynamic test. An industrial truck equipped with tires and loaded to an axle weight of 12,000 pounds (6,000 pounds per wheel) including the weight of the truck, or a loaded axle with the same characteristics, shall be used in this test. Wheel weight shall be applied to a contact area of 22 square inches per wheel, wheel width shall be not less than 7 inches, and wheel centers shall be 30 inches apart. Width of test device including load shall not exceed 48 inches. The truck or axle shall be maneuvered over the entire floor area of the container in a longitudinal direction.

4.6.2.2.8.2 Static test. The container shall be loaded to not less than two times the maximum single container payload. Sixty percent of the load shall be uniformly distributed over the longitudinal center 10 feet of the floor and the other 40 percent shall be uniformly distributed over the remainder of the floor. Load shall remain in place for not less than 5 minutes.

4.6.2.2.8.3 Failure criteria. Nonconformance to 3.12.5 shall constitute failure of this test.

4.6.2.2.9 Weatherproofness. A stream of water at variable angles shall be applied to all joints, seams and gasketed closures of the container from an 0.5 inch inside diameter nozzle at a nozzle pressure of not less than 15 psig. Rate of movement over the exterior of the container shall be approximately 4 inches per second. The nozzle shall be held 5 feet away from the container under the test. The test shall be continued for not less than 15 minutes. On completion of the test the container shall be examined for penetration of water into the interior of the container. Nonconformance to 3.12.9 shall constitute failure of this test.

4.6.2.2.9.1 Floor waterproofness. The container floor with drains sealed shall be tested for waterproofness by completely filling the floor with water to a depth of not less than 1 inch. Duration of the test shall be not less than 8 hours. Any water leakage as indicated by a reduction in the water depth shall constitute nonconformance to 3.6.1.2 and shall constitute failure of this test.

4.6.2.2.10 Racking. The container under test, shall be restrained through the bottom apertures of all four bottom corner fittings. Both doors shall be closed and latched. A concentrated force of 33,600 pounds shall be applied first laterally and then longitudinally to each top corner fitting in turn. Each force application shall be for not less

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than 5 minutes. An alternative method may be used. Only the bottom two corner fittings of the wall under test will be secured to the bedplate. Corner fittings may be secured through the side and end holes. Nonconformance to 3.12.8 shall constitute failure of this test.

4.6.2.2.11 Heat transfer. The container equipped with a 9,000 BTU per hour refrigeration unit shall be placed in a controlled temperature room. Two 9,000 Btu per hour electric motor driven refrigeration units and two 10 KW diesel engine driven generator sets will be loaned by the Government for tests (see 3.13). Eight thermocouples or thermometers, shielded from the effects of radiant heat, which have been checked against a secondary standard thermometer shall be placed outside and not less than 5 inches from each corner of the container. The ambient temperature shall be taken as the average of these eight temperatures. Electric resistors surrounded by shields to minimize radiation shall be placed within the container. Incandescent heating elements when used shall be operated at 1/2-normal voltage by connecting two in series. Four thermocouples which have been checked against a secondary thermometer, shielded from the effects of radiant heat shall be installed inside the container and positioned 6 inches from the ceiling and floor at two opposite corners. The interior temperature shall be taken as the average of the four thermocouples. An electric fan having a capacity to insure that no uncirculated air pocket will exist shall be placed within the container on the front portion of the floor and faced toward the door to provide interior air circulation. The doors shall then be closed and not opened for the duration of the test. Electric current shall then be sent through the resistor and the fan to provide 900 to 1,000 watts within the container. Electrical energy of the fan motor shall be measured by the same meter used for heating elements and this heat equivalent shall be added to other sources of heat added to the container. Electrical heat input shall be measured by a watt-hour meter. The ambient temperature shall then be maintained constant within plus or minus 2°F. Sufficient steady, nonvarying heat shall be added to the interior of the container to maintain a minimum of 60°F and a maximum of 100°F temperature difference between the interior and exterior of the container. At no time shall the interior of the container temperature exceed 155°F. The test shall be considered concluded when eight consecutive one-half hourly readings indicate that the temperature inside the container has been maintained constant within plus or minus 1°F. The heat transfer of the container shall then be determined as follows:

$$\text{Heat transfer (Btu/hr/F)} = \frac{\text{Watt hours} \times 3.415}{(\text{Interior temperature} - \text{Exterior temperature}) \times \text{time (hours)}}$$

Nonconformance to 3.12.10 shall constitute failure of this test.

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4.6.2.2.12 Air leakage. An exhaust blower, manometer, and flow meter shall be connected in series to the container cargo space through one container floor drain. The remaining floor drains shall be sealed. Air leakage shall be measured by feeding air through a flowmeter into the container in order to maintain 0.25 inch water gage pressure inside the container. The air pressure differential shall be held constant for a period of 25 minutes by throttling the exhaust blower output. Five flow meter readings shall be taken at 5 minute intervals. Nonconformance to 3.12.11 shall constitute failure of this test.

4.6.2.2.13 Pull down. The container shall be placed in a controlled temperature room with the container doors open. The test chamber shall be heated until the test chamber and the inside container wall temperature have reached 100°F. The doors shall be closed and the refrigeration unit shall be started and operated. With the test chamber maintained at 100°F, the refrigeration unit shall be operated until the average interior temperature as indicated by temperature reading instruments is 0°F. Nonconformance to 3.12.12 shall constitute failure of the test or shall be cause for disassembly of the equipped container to the extent necessary to determine the cause of the failure. Determination attributable to the Government-loaned property will require repair or replacement of the defective property by the Government and the test will be re-run. Determination that the failure is attributable to the container itself shall constitute failure of the test. When the container interior temperature is 0°F, continue to operate at a temperature of 0°F, and raise the ambient humidity to a nominal 80 percent; hold for 12 hours and observe any outside container wall for sweat patterns that develop. Any patterns that are due to other than those of high conductive container structures shall be considered insulation voids. This shall constitute failure of this test and nonconformance to 3.6.1.

4.6.2.2.14 Heat dissipation, container positioned front end to door end with a like container. The pull down test shall be repeated with the additional requirement that the test container shall be positioned 54 inches above ground level. In addition, an 8 foot x 8 foot plywood panel shall be positioned 3 inches in front of the front end of the test container to simulate container operation as a coupled (40 foot) configuration on a highway chassis. Nonconformance to 3.12.13 shall constitute failure of the test or shall be cause for disassembly of the equipped container to the extent necessary to determine the cause of the failure. Determination that the failure is attributable to the Government-loaned property will require repair or replacement of the defective property and the test shall be rerun. Determination that the failure is attributable to the container itself shall constitute failure of the test.



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4.6.2.2.15 Chassis compatibility. Two Government-loaned chassis will be used for this test (see 3.13). The chassis will be of a design that requires transmission of compressive stress through the roof rails of the containers. Bogies shall be placed in the most rearward positions. The contractor shall furnish a commercial truck tractor for this test.

4.6.2.2.15.1 Single (20 foot) configuration. A refrigerated 20-foot container equipped with refrigeration unit and engine generator set shall be mounted on a single chassis with tandem bogie, uniformly loaded to a gross container weight of 44,800 pounds and towed for not less than 20 miles on hard surface roads and for not less than 30 miles on unpaved roads. During each test, the container temperature shall be maintained at 0°F.

4.6.2.2.15.2 Coupled (40 foot) configuration. Two refrigerated 20-foot containers each equipped with refrigeration unit and engine generator set shall be mounted on two chassis coupled into a 40-foot chassis with tandem bogie on the rear chassis. Containers shall be secured by attachment of each to a chassis but not by couplers between lower corner fittings. Spacer blocks shall be used between upper corner fittings of the two containers. Both containers shall be equally and uniformly loaded such that the gross vehicle weight of the chassis and containers is 62,000 pounds. The containers shall be towed for not less than 20 miles on hard surface roads and for not less than 30 miles on unpaved roads. During each test, the container temperature shall be maintained at 0°F.

4.6.2.2.15.3 Single (20 foot) configuration at gross rated weight. A refrigerated 20-foot container equipped with refrigeration unit and engine generator set shall be mounted on a single chassis with tandem bogie uniformly loaded to a gross container weight of 44,800 pounds. The container shall be towed not less than 500 miles at variable speeds up to 50 miles per hour over hard surface roads, and for not less than 250 miles at variable speeds up to 35 miles per hour over unpaved roads. During each test, the container interior shall be maintained at 0°F for 1/2 the mileage, and shall be maintained at 40°F for the remaining mileage.

4.6.2.2.15.4 Coupled (40 foot) configuration at gross rated weight. Two refrigerated 20-foot containers each equipped with refrigeration unit and engine generator set shall be mounted on two chassis coupled into a 40-foot chassis with tandem bogie on the rear chassis. Containers shall be secured by attachment of each to a chassis but not by couplers between lower corner fittings. Spacer blocks (see 3.6.1.7) shall be used between upper corner fittings of the two containers. Both containers shall be



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equally and uniformly loaded such that the gross vehicle weight of the chassis and containers is 62,000 pounds. The 40-foot combination shall be towed for not less than 500 miles at variable speeds up to 50 miles per hour over hard surface roads, and for not less than 250 miles at variable speeds up to 35 miles per hour over unpaved roads. During each test, the container interior shall be maintained at 0°F for 1/2 the mileage, and shall be maintained at 40°F for the remaining mileage. At the conclusion of the road test, both contractor-furnished refrigeration units shall be connected to an external power source and operated 250 hours maintaining the container interiors at 0°F. Cyclic operation of not less than 4 cycles per hour of the refrigeration unit shall be effected by imposed heat loads as required. Each cycle shall include not less than 5 minutes cooling time.

4.6.2.2.15.5 Failure criteria. Any of the following shall constitute failure of this test:

- (a) Evidence of weld failure.
- (b) Permanent deformation (deformation which persists for 2 hours after removal of the load shall be considered permanent).
- (c) Any broken or torn component.
- (d) Any cracked or broken floor component.
- (e) Any detachment of a gasket.
- (f) Inability of one man standing on the ground to open or close a door without the use of tools.
- (g) Malfunction or inoperable component in the refrigeration unit or failure to maintain interior temperature.

#### 4.6.2.2.16 Maintainability

4.6.2.2.16.1 Maintenance ratio. The maintenance ratio shall be computed during preproduction and initial production testing. Nonconformance to 3.12.15.1 shall constitute failure of this test.

4.6.2.2.17 Reliability. Using the MTBF specified in 3.12.16, the container shall be tested as specified herein with "accept" and "reject" criteria in accordance with figure 4. Continue testing until either an "accept" or "reject" decision is reached. A failure is defined as any malfunction which cannot be corrected within 30 minutes (all waiting periods excluded) by adjustment, repair, or replacement action using controls and on-equipment tools or parts available to the organizational element, as prescribed in the maintenance allocation charts and is a malfunction which causes or may cause one or more of the following:

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- (a) Failure to commence operation, cessation or operation or degradation of performance below specified levels.
- (b) Damage to the container or installed equipment by continued operation.
- (c) Safety hazards to personnel.

4.6.2.2.17.1 Test procedure. The refrigerated 20-foot container equipped with refrigeration unit and engine generator set shall be mounted on a single chassis with tandem bogie uniformly loaded to a gross container weight of 44,800 pounds. As an alternate, the test can be conducted in a dual container/40 foot trailer configuration by reducing the gross weight of each container to 22,400 pounds. Test cycle shall be as follows: The container shall be towed for 7 hours at variable speeds up to 50 miles per hour over hard surface roads, and for 45 minutes at variable speeds up to 35 miles per hour over unpaved roads and 15 minutes at variable speeds up to 25 miles per hour over moderate cross country terrain. During the test, the container interior shall be maintained at 0°F. At the conclusion of the road test, the container refrigeration unit shall be connected to an external power source and operated for 16 hours under stationary conditions. Where more than one container is under test, tandem configuration for the road portion of the test is permitted, provided suitable transport equipment is available. Cyclic operation of not less than 4 cycles per hour of the refrigeration unit during testing shall be effected by imposed heat loads as required. Each cycle shall include not less than 5 minutes cooling time.

4.6.2.2.17.2 Failure criteria. Nonconformance to 3.12.16 shall constitute failure of this test.

4.6.2.2.18 Door gasket material. A sample not less than 24 inches of the container door gasket shall be subjected to a 24 hour soak at -40°F. With the test sample at this temperature, the item will be tapped with an 8 ounce hammer four times. The test shall be repeated on the same sample after a +120°F soak for 24 hours. Any noticeable cracks on the material after each test shall constitute failure of the test and nonconformance to 3.6.1.12. The gasket material shall be subject to a test conducted in accordance with ASTM 1229 for 96 hours at -40°F. Compression set in excess of 60 percent shall constitute failure of this.

4.6.2.2.19 Insulation voids. The container insulation shall be inspected during production. A door cutout or refrigeration unit cut, when utilized, shall be dismantled to determine compliance with 3.6.1. Where cutouts are not utilized for doors or refrigeration units, plugs may be taken from the internal walls of one of every 20 containers to determine conformance. Nonconformance to 3.6.1 shall constitute failure of this test.

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4.6.2.2.20 Noise level. The container, shall be tested for noise levels in accordance with MIL-STD-1474. The test shall be conducted for each method of operation i.e. when operating from the generator and also line-power. If noise exceeds 85db(A) when operating from the generator then the distance at which noise levels are 85db(A) shall be determined. Nonconformance to 3.6.1.19 shall constitute failure of this test.

4.6.2.2.21 Escape. One man shall be closed inside the equipped container. Inability of the individual to exit within the specified time without the use of tools shall constitute failure of the test and nonconformance to 3.6.1.5.

4.6.2.2.22 Operation. The refrigerated 20-foot container equipped with refrigeration unit and engine generator set shall be mounted on a single chassis with tandem bogie uniformly loaded to a gross container weight of 44,800 pounds. As an alternate, the test can be conducted in a dual container/40 foot trailer configuration by reducing the gross weight of each container to 22,400 pounds. Test cycle shall be as follows: The container shall be towed for 7 hours at variable speeds up to 50 miles per hour over hard surface roads, and for 45 minutes at variable speeds up to 35 miles per hour over unpaved roads and 15 minutes at variable speeds up to 25 miles per hour over moderate cross country terrain. During the test, the container interior shall be maintained at 0°F. At the conclusion of the road test, the container refrigeration unit shall be connected to an external power source and operated for 16 hours under stationary conditions. Where more than one container is under test, tandem configuration for the road portion of the test is permitted, provided suitable transport equipment is available. Cyclic operation of not less than 4 cycles per hour of the refrigeration unit during testing shall be effected by imposed heat loads as required. Each cycle shall include not less than 5 minutes cooling time. Each container shall be subjected to 30 complete cycles. Malfunction or inoperable component or damage to the refrigeration unit or container or damage to the mounting elements of the generator or degradation of the refrigeration unit performance below specified levels shall institute failure of this test.

4.7 Inspection comparison. The Government may select containers at any time during the contract production period and subject these containers to determine conformance to the requirements of this specification. The inspection will be performed by the Government at a site selected by the Government and will not include the previously inspected preproduction and initial production containers. In addition to any test specified as part of the inspection comparison, the Government reserves the right to conduct any and all other tests contained in this specification as part of the inspection comparison and failure of such additional tests shall have the same effect as failure of those tests specified as inspection comparison.

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4.7.1 Inspection failure. Failure of an inspection comparison container to meet any requirement specified herein during and as a result of the examination and tests specified in 4.7 shall be cause for rejection of the inspection comparison container and shall be cause for refusal by the Government to continue acceptance of production container until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiencies. Correction of such deficiencies shall be accomplished by the contractor at no cost to the Government on containers previously accepted and produced under the contract. Any deficiencies found as a result of the inspection comparison will be considered prima facie evidence that all containers accepted prior to the completion of inspection comparison are similarly deficient unless evidence to the contrary is furnished by the contractor and such evidence is acceptable to the contracting officer.

#### 4.8 Inspection of packaging

##### 4.8.1 Quality conformance inspection of pack

4.8.1.1 Unit of product. For the purpose of inspection, a container prepared for shipment shall constitute a unit of product.

4.8.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-1235, Plan CSP-1. Frequency Code Letter A.

4.8.1.3 Examination. Samples selected in accordance with 4.8.1 shall be examined for the characteristics listed in Table III. AQL shall be 2.5 percent defective for major defects and 4 percent defective for minor defects.

TABLE III - EXAMINATION SCHEDULE-PACKAGING

NUMBER	CHARACTERISTIC	REQUIREMENT PARAGRAPH
<u>MAJOR</u> 131	Preservation not Level A, level B, or Commercial as specified (see 6.2).	5.1
131	Refrigeration unit opening not preserved for Level A as specified.	5.1.1.1
132	Auxiliary fuel tank not preserved for Level A as specified.	5.1.1.2
133	Electric power cable not preserved for Level A as specified.	5.1.1.3
134	Exhaust lines not preserved for Level A as specified.	5.1.1.4
135	The glass face of the recorder not protected for Level A as specified.	5.1.1.5
136	The recorder charts not preserved for Level A as specified.	5.1.1.6

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TABLE III - EXAMINATION SCHEDULE-PACKAGING

<u>NUMBER</u>	<u>CHARACTERISTIC</u>	<u>REQUIREMENT PARAGRAPH</u>
137	Loose bolts and washers not preserved for Level A as specified.	5.1.1.7
138	Generator set not preserved for Level A as specified.	5.1.1.8
139	Refrigeration unit not preserved for Level A as specified.	5/1/1/9
140	The container and its contents not preserved for Level B as specified.	5.1.2
141	The container and its contents not preserved for Commercial as specified.	5.1.3
142	Packing not required.	5.2
<u>MINOR</u>		
212	Marking for military packaging not in accordance with MIL-STD-129.	5.3.1
213	Marking for Commercial packaging not in accordance with MIL-STD-1188.	5.3.2

## 5. PACKAGING

5.1 Preservation. Preservation shall be Level A, Level B or Commercial as specified (see 6.2).

### 5.1.1 Level A

5.1.1.1 Refrigeration Unit Opening. When a plywood cover plate is furnished in lieu of the refrigeration unit (see 3.6 and 6.2), it shall be installed over the refrigeration unit opening.

5.1.1.2 Auxiliary fuel tank. Fuel tanks fabricated from materials requiring the application of a preservative in accordance with the criteria of MIL-P-116 shall be filled with preservative oil conforming to Type I or Type II, Grade 30 of MIL-L-21260. The oil shall then be completely drained into a recovery container. Any removed drain plugs shall be coated with the preservative oil specified herein and reinstalled. The fuel line fitting cap shall be installed on the fuel line.

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5.1.1.3 Electric power cable. The bare end of the cable shall be wrapped with tape conforming to PP-T-60. The tape shall extend back over the insulation at least 4 inches. The connector shall be protected from dirt, moisture, and thread damage by a protective cap or by wrapping with tape specified herein.

5.1.1.4 Exhaust lines. The interior surfaces of the exhaust lines shall be atomized sprayed with oil conforming to MIL-L-21260, Type I or II, Grade 30. Rain caps shall be secured to prevent opening using tape conforming to PPP-T-60.

5.1.1.5 Recorder. The glass face of the recorder shall be protected with a piece of plywood placed over and completely covering the glass area. The plywood shall be held in place with tape conforming to PPP-T-60.

5.1.1.6 Recorder charts. The recorder charts shall be preserved in accordance with MIL-P-116, Method IA-8 and secured inside the container.

5.1.1.7 Bolts and washers. Loose bolts and washers shall be preserved in accordance with MIL-P-116, Method IC-1 or IC-3 and secured inside the container.

5.1.1.8 Generator set. The generator set, when furnished (see 3.1 and 6.2) shall be preserved in accordance with the Level A requirements of MIL-G-28554 except that instead of bolting to a shipping container base, the generator set shall be bolted through the barrier material to the refrigerated container floor frame with the fasteners provided. A cover shall be provided consisting of ends, sides and top constructed in accordance with PPP-B-601 for an overseas type, Style I box. An inspection port shall be installed on an end or side of the box in a location convenient for inspection of the humidity indicator. The cover shall be secured using wood wedges and lag screws or nails. The wedges shall be cut to fit the angle of the ends of the generator skids and shall be of sufficient length and width to provide a snug fit to the inside of the cover. The angle surface of the wedge shall be cushioned with fiberboard where contact with the barrier is required. The lag screws or nails shall be of minimum length required to secure the cover to prevent puncture of the barrier material.

5.1.1.9 Refrigeration Unit. The refrigeration unit, when furnished, (see 3.1 and 6.2) shall be preserved in accordance with Method 1 of MIL-P-116 using P2 or P6 preservative of the exterior portion of the refrigeration unit shall be completely covered with a shroud made from material conforming L-P-378. Type I Chassi 4 mils thick and black in color. The shroud shall be sealed to the container around the unit with tape conforming to PPP-T-60.

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5.1.2 Level B. The container and its components shall be preserved as specified for Level A except the generator sets shall be preserved in accordance with the Level B requirements of MIL-G-28554 and the generator covers shall be fabricated as specified for a domestic type box.

5.1.3 Commercial. When a cover plate is furnished in lieu of the refrigeration unit (see 3.6 and 6.2), it shall be installed over the refrigeration unit opening. The fuel line fitting cap shall be installed on the fuel line. The container and its components shall be preserved in accordance with MIL-STD-1188.

5.2 Packing. The containers will not require packing (see 6.7).

5.3 Marking

5.3.1 Military packaging. Marking shall be in accordance with MIL-STD-129 (see 6.7).

5.3.2 Commercial packaging. Marking shall be in accordance with MIL-STD-1188 (see 6.7).

6. NOTES

6.1 Intended use. The refrigerated container is intended for transporting and storing military and quasi-military refrigerated cargo; both frozen and unfrozen. The container can be lifted from top or bottom corner fittings, and can be carried by highway, railroad, or water modes of transport.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Time frame required for submission of first-produced containers (see 3.2).
- (c) When the Government will conduct any or all of the first-article preproduction container examination and tests. When the Government will conduct a portion of the first-article preproduction examination and tests, the contracting officer should specify which examination and tests will be conducted by the Government and which examination and tests shall be conducted by the contractor (see 3.2).
- (d) When initial production inspection is required and number of containers to be furnished, when applicable (see 3.3).
- (e) When spacer blocks are to be furnished by the Government (see 3.6.1.7 and 6.4).



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- (f) When one spacer block will be delivered with each container (see 3.6.1.7).
- (g) Identification code and unit serial number for each container (see 3.8 (a)).
- (h) When contractor is not required to provide refrigeration unit or mount generator set (see 3.1 and 3.6).
- (i) Degree of preservation required (see 5.1 and 6.7).
- (j) When refrigeration unit plywood opening cover plate will be supplied with each container (see 3.6).

6.3 First-article-preproduction containers. Any changes or deviation of production containers from the approved first-article preproduction containers during production will be subject to the approval of the contracting officer. Approval of the pre-produced containers will not relieve the contractor of his obligation to furnish containers to this specification.

6.4 Government-furnished property. When specified, the contracting officer should arrange to furnish the property specified in 3.6.1.7. The contracting officer will arrange to furnish the generator sets specified in 3.13.1.

6.5 Government-loaned property. The contracting officer should arrange to loan the property specified in 3.13 when specified.

6.6 Reliability. The Government-furnished generator shall be assumed to have a specified MTBF of 468 hours and shall be assumed operational during 8 hours of every 24 hours of testing (see 3.12.16). The container specified MTBF of 400 hours includes apportionment of the refrigeration unit and generator set reliability requirements.

6.7 Marking for preservations and packing. For the purpose of marking for shipment, the degree of packing shall be marked the same as the degree of preservation specified, i.e., A/A, B/B, Commercial/Commercial.

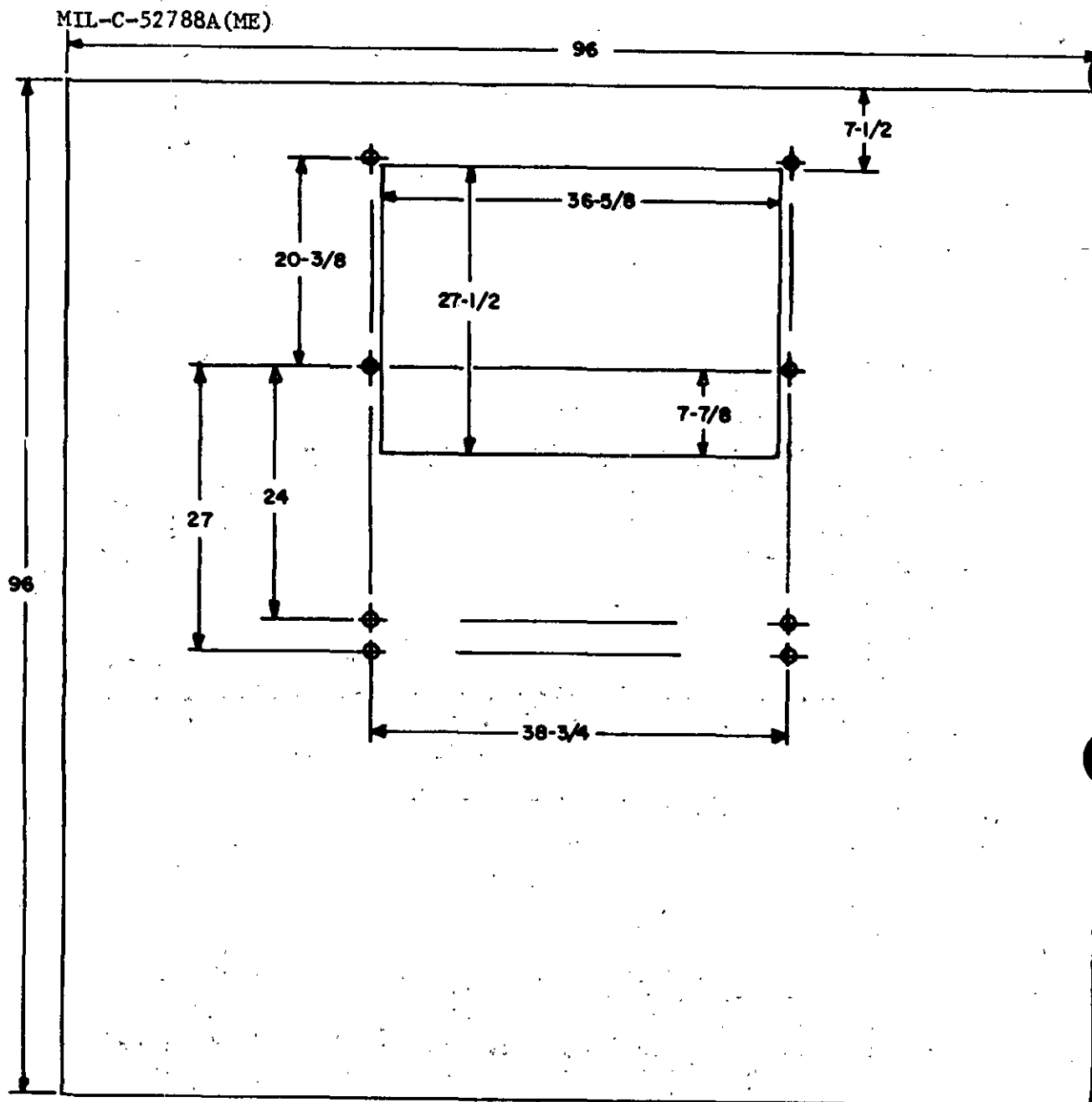
6.8 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of the specification (see 3.5).

Custodian:  
Army - ME

Preparing activity:  
Army - ME

Review activities:  
Army - GL, SM

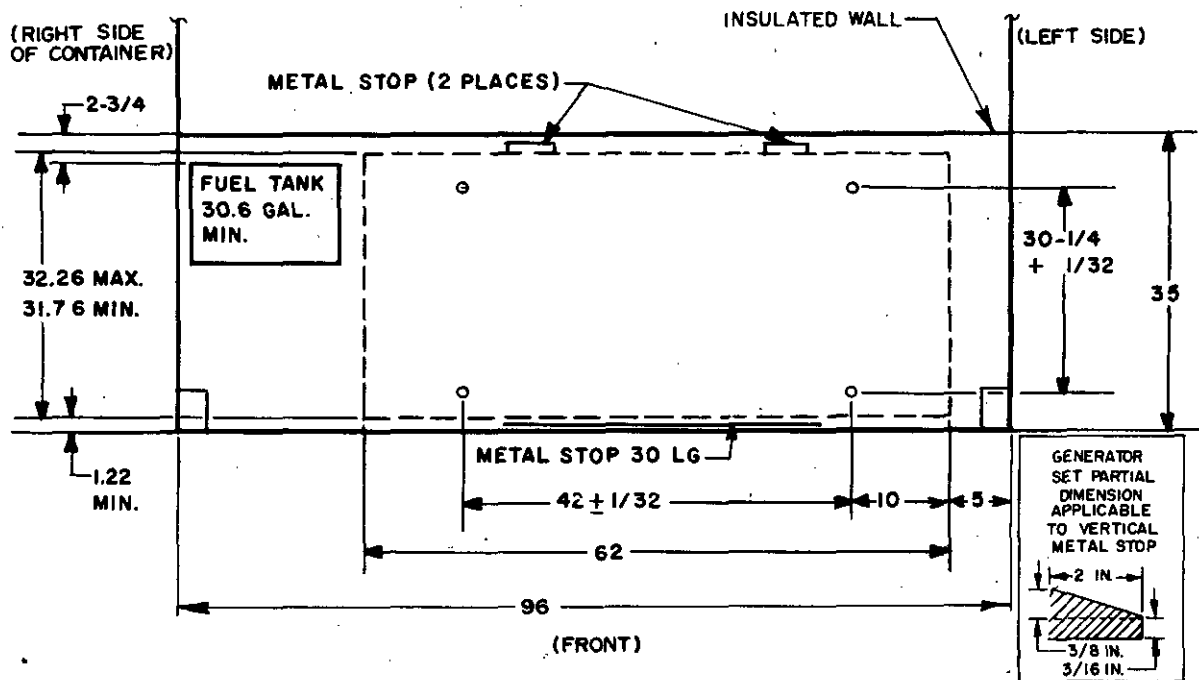
Project No. 8115-A433

**NOTE:**

MOUNTING OF UNIT WILL USE STUDS THAT ARE SCREWED INTO CAPTIVE NUTS WELDED TO CONTAINER FRAME. EIGHT ARE REQUIRED. THE NUTS SHALL BE 3/4" SIZE COARSE THREAD. NOT TO SCALE; TOLERANCE  $\pm 1/32$ " ALL DIMENSIONS IN INCHES.

FIGURE 1. UNIT OPENING 8x8x20 REFRIGERATED CONTAINER

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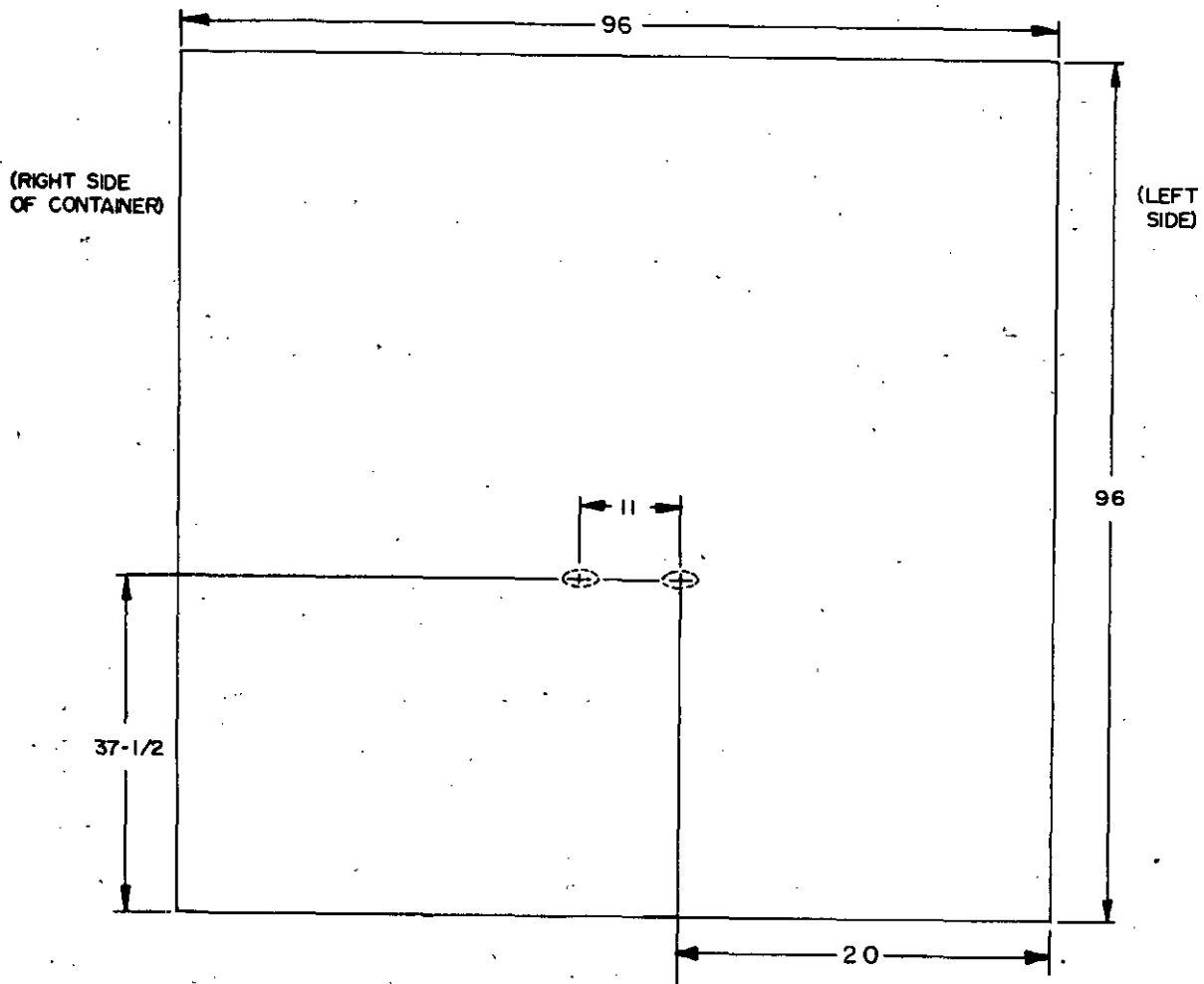
## NOTE:

MOUNTING OF GENERATOR SET WILL USE BOLTS THAT ARE SCREWED INTO CAPTIVE NUTS WELDED TO CONTAINER FLOOR FRAME. FOUR BOLTS ARE REQUIRED. THE NUTS SHALL BE 1/2 INCH SIZE COARSE THREAD. NOT TO SCALE. DIMENSIONAL HOLE LOCATION TOLERANCE  $\pm 1/32$  INCH. ALL DIMENSIONS ARE IN INCHES. THE BOLTS SHALL BE OF SUFFICIENT LENGTH TO FASTEN GENERATOR SKIDS THAT ARE 1/4 INCH THICK.

FIGURE 2. Generator set mounting nuts and fuel tank location 8x8x20 ft. refrigerated container plan view.

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## NOTE:

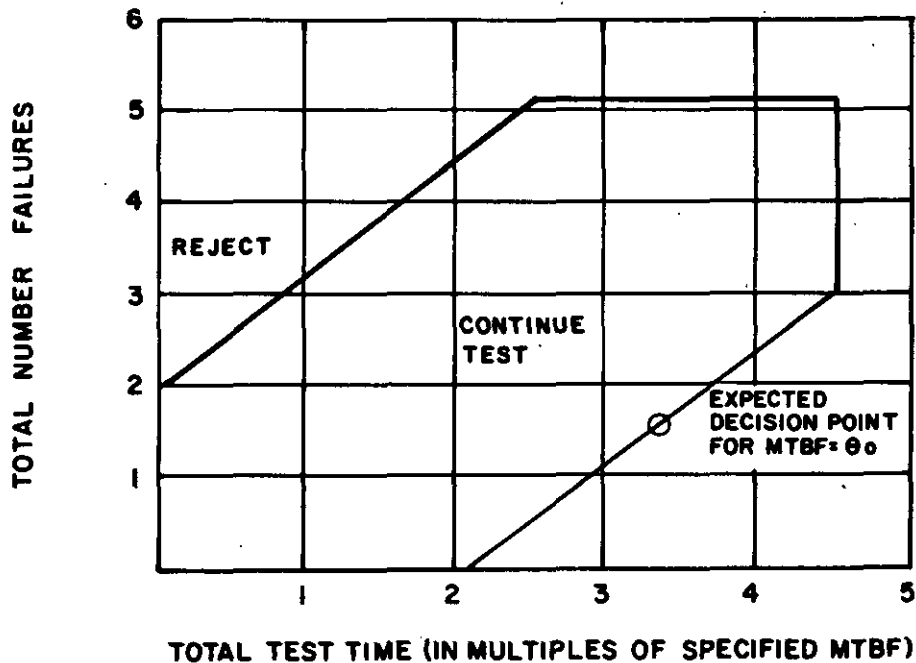
ENGINE HAS TWO EXHAUST LINES. PIPES ARE 1-1/4 INCH SIZE AND EQUIPPED WITH PIPE THREAD ON THE OUTSIDE DIAMETER. EXHAUST LINES ARE ANGLED DOWN 45 DEGREES FROM THE HORIZONTAL AND POSITIONED 10 INCHES IN FRONT OF THE CONTAINER INSULATED WALL. NOT TO SCALE. ALL DIMENSIONS IN INCHES.

**FIGURE 3. Engine exhaust line(s) location 8x8x20 ft. refrigerated container.**

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DECISION RISKS 30%  
DISCRIMINATION RATIO 1.5 : 1



NO. OF FAILURES	TOTAL TEST TIME <sup>1/</sup>	
	REJECT (EQUAL OR LESS)	ACCEPT (EQUAL OR MORE)
0	N/A	840
1	N/A	1164
2	N/A	1488
3	324	1812
4	648	1812
5	972	1812
6	1812	N/A

<sup>1/</sup> TOTAL TEST TIME IS TOTAL UNIT HOURS OF "EQUIPMENT ON" TIME AND IS EXPRESSED IN MULTIPLES OF THE SPECIFIED MTBF.

FIGURE 4. Accept-reject criteria.

X-3599





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