MIL-C-23880D
23 December 1983
SUPERSEDING
MIL-C-23880C
3 May 1978

MILITARY SPECIFICATION

CABINETS, FOOD WARMING, ELECTRIC, PASS-THROUGH AND REACH-IN

This specification is approved for use by the Naval Facilities Engineering Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

* 1.1 Scope. This specification covers electrically heated, pass-through, and reach-in stationary food warming cabinets.

* 1.2 Classification. Food warming cabinets shall be of the following types and sizes as specified (see 6.2).

Type I - Standard commercial food warming cabinets in following sizes:

Size	Number of sections in cabinets	Minimum number of pans (18" by 26" by 1-1/4") on 3" centers
4	1	4
8	2	8
12	3	12
15	3	15
18	1	18
36	2	36
54	3	54

Type II - Modified commercial food warming cabinets, three compartments.

Type Ill - Modified commercial food warming cabinets, two compartments.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 7310

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified (see 6.2), the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-S-775 - Steel Sheets, Carbon, Zinc Coated (Galvanized) By the Hot Dip Process.

MILITARY

MIL-V-173 - Varnish, Moisture and Fungus Resistant (For Treatment of Communications, Electronic and Associated Equipment.

MIL-B-2316 - Bakery Equipment, Including Unit, Assemblies, Repair Parts and Tools, Preparation For Delivery Of.

STANDARDS

FEDERAL

FED-STD H28 - Screw Threads Standards for Federal Services.

MILITARY

MIL-STD-105 - Sampling Procedures and Tables For Inspection by Attributes.

(Copies of specifications, standards, drawings, and publications 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 document(s) 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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

A176 - Stainless and Heat-Resisting Chromium-Steel Plate, Sheet, an Strip.

A480 - General Requirements for Flat-Rolled Stainless and Heating-Resisting Steel Plate, Sheet, and Strip.

B209 - Aluminum-Alloy Sheet and Plate.

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

No. 70 - National Electrical Code.

(Application for copies should be addressed to the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.)

NATIONAL SANITATION FOUNDATION (NSF)

No. 2 - Food Service Equipment and Appurtenances Seal of Approval Listing of Food Service Equipment.
No. 4 - Commercial Cooking and Hot Food Storage Equipment.

(Application for copies should be addressed to the National Sanitation Foundation, NSF Building, 3475 Plymouth, Ann Arbor, MI 48106.)

UNDERWRITERS' LABORATORIES, INC. (UL)

UL 197 - Commercial Electric Cooking Appliances
UL Electrical Construction Materials List.

(Application for copies should be addressed to the Underwriters' Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

* 3.1 Description. The food warming cabinets shall either consist of a single section or multiple sections, in accordance with the type and size specified. Each section shall be insulated and equipped with front and rear doors for pass-through cabinets and with front doors for reach-in cabinets, electric heating element(s), shelf or pan supports, junction box, thermometer, signal light(s) and other components required for satisfactory operation. Type I cabinets shall conform to the dimensions specified in Table I. When specified (see 6.2), the maximum overall dimensions for type II and type III cabinets shall be as indicated in Figure 1 and Figure 2 respectively. All other dimensions for type II and III shall be as specified in Figures 1 and 2. Sections for sizes 8, 12, and 15 shall be designed to be stacked vertically. Sections for sizes 36, an 54 shall be designed to be assembled horizontally to form a continuous inline cabinet.

Table I. Maximum overall dimensions in inches.

Size	4	8	12	15	18	36	54
Width	28	28	28	30	28	54	82
Depth, over hardware	36	36	36	39	39	39	39
Depth, over open doors	58	58	58	58	86	86	86
Height (including legs or base)	36	54	74	74	85	85	85
Height (no legs)	18	-	-	-	-	-	-

3.2 First Article. When specified (see 6.2), the contractor shall furnish a cabinet for first article inspection and approval (see 4.2.1 and 6.3).

3.3 Standards compliance. Food warming cabinets shall conform to NSF No. 2, NSF No. 4 and UL197.

* 3.3.1 Certification. Prior to approval of the first article, if one is submitted, or prior to approval of the first shipment, the contractor shall submit satisfactory evidence to the contracting officer or his authorized representative that the food warming cabinet he proposes to supply under this specification meets the requirements of NSF No. 2, NSF No. 4 and UL197.

* 3.3.1.1 NSF certification. Acceptable evidence of meeting the requirements of NSF No. 2 and NSF No. 4 shall be the NSF seal on the finished food warming cabinet and a listing in the NSF Seal of Approval Listing of Food Service Equipment, or a certified test report from a recognized independent testing laboratory, acceptable to the medical authority functioning in an advisor capacity to the preparing agency of the specification, indicating that the food warming cabinet conforms to NSF No. 2 and NSF No. 4.

* 3.3.1.2 UL certification. Acceptable evidence of meeting the requirements of UL197 shall be the UL label, UL listing mark, or a certified test report from a nationally recognized independent testing laboratory,. acceptable to the contacting officer, stating that the food warning cabinets have been tested and conform to UL197.

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

* 3.4.1 Dissimilar metals. Contact between dissimilar metals likely to cause deterioration of parts by galvanic corrosion shall be avoided. Where such contact cannot be avoided, joints between dissimilar metals shall be protected against galvanic corrosion by plating, coating insulation, gaskets, or other suitable means. Bolts, nuts, pins, screws, and other fastenings shall be of the same material as the metals joined or shall be cathodic to the metals joined.

3.4.2 Galvanized sheet steel. Galvanized steel sheets shall conform to the requirements for class d of QQ-S-775.

* 3.4.3 Corrosion-resisting steel. Corrosion-resisting steel shall be class 302 or 304 of ASTM A167, or class 430 of ASTM A176, annealed or tempered to suit the intended application. The surface finish shall be No. 4, as defined in ASTM A480, except that concealed surfaces may be finished in accordance with the manufacturer's standard practice.

* 3.4.4 Aluminum. Aluminum shall be an alloy conforming to the requirements of ASTM B209. The alloy selected shall have mechanical properties, formability, and a finish to suit the intended application.

* 3.5 Interchangeability of items. All cabinets of the same classification furnished under any specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, and spare parts. No deviations will be acceptable without prior written approval of the contracting officer. All threaded parts shall conform to FED-STD-H28.

3.6 Design. The design of the food warming cabinets and accessories shall permit accessibility for maintenance and service in the field. The cabinets shall be designed to preclude conditions hazardous to personnel or deleterious to equipment. Positive protection against electrical shock shall be provided.

* 3.7 Construction. Food warming cabinets shall be constructed in accordance with the requirements herein and the general construction provisions of NSF No. 2. The cabinets shall be of all-metal construction with adequate ability to withstand the stresses, jars, an vibrations incident to shipping, storage, an operation with a full load. Unless otherwise specified (see 6.2), the exterior of the door frames and the top, bottom, and side panels shall be constructed of 20-gage corrosion-resisting steel. The top exterior shall be constructed of 20-gage corrosion-resisting steel, bottom exterior shall be constructed of 20-gage galvanized sheet steel. When specified (see 6.2) the bottom exterior shall be constructed of 20-gage corrosion-resisting steel. The interior cabinet lining and all shelving shall be constructed of corrosion-resisting steel or aluminum alloy.

3.7.1 Type I food warming cabinets.

3.7.1.1 Top, bottom, and side panels. Panels shall consist of double walls enclosing a suitable insulating material which, when installed, shall be not less than 1.5-inch thick. Panels shall be fitted to adjacent members and sealed as required to provide a substantially moisture-proof enclosure. A minimum thickness of 1.5-inch of insulation shall be provided between sections on two-and three-section cabinets.

3.7.1.2 Doors. Doors shall be fabricated of the same material as the panels and if suitably strengthened may be a minimum 22 gage. The doors shall be hinged to permit full access to all shelves and pan supports and shall be provided either with replaceable-type heat-resistant (to 375 deg Fahrenheit (deg F)) gaskets, or a mechanical-type seal such as a recessed and interlocking design. Doors shall be of double-wall construction having a 1.5-inch minimum thickness of insulation. Hardware shall be either corrosion-resisting steel, chromium-plated steel, chrome plated brass or alloy metal. Doors shall be

provided with either positive action latches or spring-locked hinges. When specified (see 6.2, door locks shall be provided. The number of doors per section shall be in accordance with 3.1.

* 3.7.1.3 Shelves. Unless otherwise specified (see 6.2), a minimum of three readily removable shelves shall be furnished with each section; for sizes 4, 8, an 12; a minimum of four shelves per section for size 15, and a minimum of seventeen shelves per section for sizes 18, 36, and 54. Corrosion-resisting shelf supports shall permit adjustment on 1-inch centers.

3.7.1.4 Adjustable universal angles. When specified (see 6.2), the cabinet section(s) shall be provided with sufficient sets of adjustable universal angles to satisfy the size requirements listed in 1.2. The angles shall be capable of rigidly supporting fully loaded pans and trays having depths up to 4-1/2 inches, and shall be readily adjustable on 1-or 1-1/2 inch centers. The following pan sizes (in inches) shall be accommodated: 18 by 26, 20 by 24, 12 by 20, and 14 by 18.

* 3.7.1.5 Legs. Unless otherwise specified (see 6.2), cabinets shall be supported on adjustable legs. When specified (see 6.2), sizes 15, 18, 36, and 54 shall be supported on an enclosed base,. Legs and feet shall be fastened to the cabinet in a manner to prevent the accumulation of dirt. All openings between feet and legs shall be drip-proof construction in which any openings larger than 1/32 inch shall be sealed. Legs shall provide a minimum 6-inch unobstructed clearance between the floor and the lowest horizontal member of the cabinet, excluding service connections. Both legs and feet shall be of NSF-approved construction.

3.7.2. Type II and III food warming cabinets. Type II and III cabinets shall be pass-through or reach-in as specified (see 6.2).

3.7.2.1 Cabinet. Three sections (compartments) shall be included, arranged vertically in type II cabinets. The side, front, and rear panels of the cabinet shall be corrosion-resisting steel, not less than 0.036-inch thick, properly polished and finished. The top panel shall be corrosion-resisting steel not less than 0.047-inch thick. The bottom panel may be galvanized or aluminized steel not less than 0.036-inch thick. The side, front, back, and bottom panels shall be welded to form a rigid cabinet, and the top panel shall be fastened by screws. For cabinets utilizing two heating elements, a six-sided partition of aluminized steel not less than 0.024-inch thick shall be located inside the cabinet. The space between partition and outer panels shall be filled with 2-inch fiberglass material compressed to 1.5 inch or foam with equivalent rating, minimum "K" factor of 2.60. Between the partition and the sections shall be an air space of at least 1.5 inch to permit circulation of heated air, for cabinets utilizing a continuous thermal type cable element, no air space shall be maintained between insulation and inner shell. Cabinets with either element shall maintain a uniform temperature within each sections. The inner partition of aluminized steel shall be adequately supported and reinforced and shall be attached to the outer panels by small welded metal spacers. Hardware components and any part of the cabinet in contact with food, or which is visible, shall be made from corrosion-resisting steel. Construction of the type III cabinet shall be indentical with the requirements of type II, except type III shall have two compartments. Each type III compartment shall have minimum inside dimensions of 22 inches wide by 30-1/2 inches deep by 27 inches high. Each compartment

shall have individual thermostat control. The reach-in cabinets shall be of identical size as the pass-through cabinets minus the thickness of the rear doors.

* 3.7.2.1.1 Sections (compartments). Each section shall be die-stamped and constructed of corrosion-resisting steel not less than 0.030-inch thick. The front flange of the section shall be 3/8-inch high and shall fit into an embossed surface stamped into the front panel of the body. Each section shall have hole(s) which will act as vent(s) for moisture control (see 3.9.1). Each section shall be secured to the body with screws and supported underneath by a steel channel. Sections shall be completely removable for inspection, cleaning, or replacement.

* 3.7.2.1.2 Compartment capacity (type II cabinet). Each side of the top section of this three compartment cabinet shall have two pairs of corrosion-resisting steel wall studs riveted in place to support adjustable corrosion-resisting steel angle-support brackets to provide a capacity of six or more 12 inch by 20 inch by 4-inch pans. The center and bottom sections shall be similarly equipped with three pairs of wall studs and brackets to provide a capacity of eight 12 inch by 20 inch by 4 inch or eight inch by 26-inch bun pans or trays for each compartment. The type II cabinet shall accommodate a minimum of ten 12 inch by 20 inch by 2-inch food service pans in each compartment. The brackets for all sections shall be 5 inches wide and 26 inches long.

* 3.7.2.1.3 Compartment capacity (type III cabinet). Each side of the top and bottom section of this two compartment cabinet shall have two pairs of corrosion-resisting steel wall studs riveted in place to support adjustable corrosion-resisting steel angle-support brackets to provide a capacity of 10 or more 12 inch by 20 inch by 4-inch pans and a minimum of thirteen 18 inch by 26-inch bun pans or tays, or eighteen 12 inch by 20 inch by 2-inch food service pans in each compartment. The brackets for both sections shall be 5 inches wide and 26 inches long.

3.7.2.2 Doors. The doors shall be die-stamped and of double-pan type construction securely welded together with corners ground and polished and all seams solder-filled for sanitation. The space between the inner and outer panels shall be reinforced internally for mounting of required hardware. The doors panels shall be not less than 0.036-inch thick. Each door shall consist of two vertical halves which open and close simultaneously. Three sides of each half of the door shall overlap the cabinet body to insure a tight seal. Gaskets may be used in the cabinet or doors. An opening and closing mechanism shall be mounted in the top of each section and shall provide an automatic stop to hold the door in the open position. When in the open position, the doors including the handles shall not exceed the overall width of the cabinet. The panels shall be embossed for strength. A handle of corrosion-resisting steel shall be mounted vertically on the outer panel of each half door be screws. The doors shall be mouned on corrosion-resisting spring hinges. The spring tension of the hinge shall be adjustable externally without the need of special tools. The spring shall be completely concealed within the hinge. Hinges shall be mounted on the left and right cabinet panels to permit a movement of 90 deg and shall be securely fastened to the door by three screws and to the cabinet by three screws.

* 3.7.2.3 Base. The cabinet shall be mounted on a recessed toe base. Provision shall be made for a 3-inch adjustment in height.

3.8 Controls.

3.8.1 Moisture control. Each section shall be provided with a moisture control device in accordance with the manufacturer's standard practice and as specified in 3.9.1.1 and 3.9.1.2. All parts in contact with food shall be constructed of corrosion-resisting steel. All vents shall be covered to prevent the entrance of moisture, dirt, an other contamination.

3.8.1.1 Dampers. Dampers, when finished, shall consist of flat plates actuated by a linkage mechanism. All metal parts shall be corrosion-resisting steel. The flat damper plates shall be in direct contact with the top of each section and shall be directly over the vent holes in the section. The end of the linkage mechanism shall protude beyond the body of the cabinet through two holes. The ends shall be covered with one red and one black plastic pushbutton. The red button shall be marked "O" and the black button "C" to indicate the open or closed position of the damper plates. When actuated manually, these pushbuttons shall position the flat damper plates in relation to the vent holes, thereby permitting control of the moisture in each section.

3.8.1.2 Door vents. Door vent(s), when provided, shall consist of opening(s) in door(s) and a positive mechanical device to regulate the vent hole opening(s).

3.8.2 Heating capacity and temperature control. The heating elements shall be capable of raising empty cabinet temperature from 75 +/- 5 deg P to 150 deg within a period of 30 minutes. The individual sections shall be capable of maintaining a temperature within 10 deg F of any thermostat setting within the range of 150 deg -200 deg F.

* 3.9 Electrical wiring and components. Unless otherwise specified (see 6.2), food warming cabinets in sizes 4, 8, 12, 15, and 18 shall be wired for operation with a power supply of 120 volts (V), single phase, 60 Hertz (Hz); cabinets in sizes 36 and 54, and of types II and III, shall be wired for 240 V, single phase, 60 Hz. When specified (see 6.2), type I cabinets in sizes 36 and 54, and type II and III cabinets shall be wired for either 208V, 60 Hz, single phase for continental United States (CONUS); or 220V, 50 Hz, single phase for European requirements. All wire, cord, and electrical components, such as controllers, switches, heaters, blowers, and solenoid valves shall bear the UL listing mark and be listed in the UL Electrical Construction Materials List, and shall be installed in accordance with NFPA No. 70. When specified (see 6.2), a disconnect switch shall be furnished. The disconnect switch shall have a voltage and current rating conforming to the requirements of NFPA No. 70. Disconnect switches for type II and III cabinets shall be equipped with overload protective devices. A wiring diagram shall be furnished with each cabinet.

* 3.9.1 Electric heater. Each section of the food warming cabinet shall be equipped with thermostatically controlled electric heating elements. The wattage rating specified herein shall be based on 120V or 240V, as applicable. When operation of sizes 36 and 54, and type II or III on 208V is specified (see 6.2), the resistance of the elements shall be decreased in order to provide the heat output equivalent to the heat output on 240V. For

type I cabinets, each section shall be equipped with one or more elements having a total rating per section of not less than 1000 watts (W). The number and location of the elements shall be such as to insure compliance with 3.8.2. Heating for type II and III cabinets shall be by means of two heating elements or by a continuous thermal heating cable in accordance with the manufacturer's standard practice. The heating elements shall be mounted in the air space of the cabinet between the aluminized steel partition and the bottom of each section. Each heater shall be rated at a minimum of 500W for a total of not less than 1000W per section and 3000W per cabinet for the three compartment cabinet or not less than 1500W per section and 3000W per cabinet for the two compartment cabinets. These elements shall operate on the power specified (see 3.9). The terminal shall be on one end facing the front of the cabinet. The heaters shall be mounted on two brackets. Surrounding each heater element shall be a steel baffle covered with insulation to properly direct the flow of heat within the cabinet air space. The heating cable element shall be evenly wrapped around each inner shell of the cabinet, and rated at a minimum of 500W for 50 feet of element, or 100 feet of element for a total of not less than 1000W per section. The thermal type cable element shall be continuous, and in direct contact with insulation specified in 3.12. Heat shall be directed to the interior of the cabinet. For type I, II, and III cabinets, the heating elements and wiring shall be completely concealed to protect units from food spillage or injury to the user, as a result of accidental contact. Heating elements shall not be located in the same area in which food is stored. Heating elements shall not permit cooking of food.

3.9.2 Thermostat. A readily accessible thermostat shall be installed in each section to permit heat adjustment and automatic temperature regulations within the minimum range of 150 deg F and 200 deg F.

* 3.9.3 Switch. Each section of the food warming cabinet shall be equipped with an ON-OFF switch unless the thermostat provides an ON-OFF control. For type I cabinets, each section shall be furnished with at least one signal light to indicate that the heating element(s) are energized. For type II an III cabinets, two signal lights shall be furnished for each section. One amber colored light shall glow when electric power is connected to the cabinet. The red colored indicator light shall glow when the thermostat is operating and the preselected temperature has not been reached. When the selected temperature has been reached, the red indicator light shall extinguish automatically.

3.9.4 Power supply cord and plug. Food warming cabinets for continental United States (60 Hz) shall be supplied with a power supply cord and a NEMA plug as indicated below:

Type	Minimum Wattage Rating	Compartments or Sections	Volts	Phase	NEMA Plug
I	1000	1	120	1	5-15P
I	1000	1	208-240	1	6-15P
I	3000	2	208-240	1	6-20P
I	3000	3	208-240	1	6-20P
I	3000	3	208-240	3	15-15P
II	3000	3	208-240	1	6-20P
II	3000	3	208-240	3	15-15P
III	3000	2	208-240	1	6-20P
III	3000	2	208-240	3	15-15P

* 3.10 Thermometer. When specified (see 6.2), each section of the three types of cabinets shall be equipped with an exterior, dial-type thermometer.

* 3.11 Insulation. The insulation for the cabinet side panels, top, base and doors shall be mineral fiber insulating material, or equivalent, and asbestos-free heat-resisting insulating material where required. Asbestos, or any other insulating material containing asbestos shall not be used. The insulation shall be nonmoisture absorbing, and so installed as not to separate, compact, or settle under normal conditions of shipment and use. The insulation shall be such that with the internal temperature of the cabinet at 200 deg F, the average temperature of the exterior surface shall not exceed ambient temperature by more than 30 deg F (see 4.5.3).

* 3.12 Identification marking. Identification and instructions shall be permanently and legibly marked directly on the cabinet or on an aluminum, brass, or corrosion-resisting steel plate, firmly affixed to the cabinet. The information shall include the manufacturer's name or trademark, model number, and serial number. In addition, information required by UL197 shall be included on the plate. Unless otherwise specified (see 6.2), the cabinets shall include the national stock number and the contract number.

* 3.13 Fungus resistance. When specified (see 6.2), electrical components and circuit elements, including terminal and circuit connections shall be coated with varnish conforming to MIL-V-173, except that:

a. Components and elements inherently inert to fungi or in hermetically sealed enclosures need not be coated.
b. Current-carrying contact surfaces, such as relay contact points, shall not be coated.

* 3.14 Commercial publications. When specified in the contract (see 6.2.1), the manufacturer's standard commercial publications shall be furnished.

* 3.15 Workmanship.

*3.15.1 Fabrication. The quality of workmanship shall be such as to produce cabinets that are in accordance with the requirements of this specification and are so constructed as to insure proper functioning of all parts of the unit. Also, the cabinets shall be free from indentations, racks, flaws, slivers, faulty riveting, spilly metal, or other harmful defects which would interfere with the use of the cabinet in the application for which it is intended. The straightening of material shall be done by methods that will not cause injury to the metal. Shearing and chipping shall be done neatly and accurately. All bends of a major character shall be made with controlled means in order to insure uniformity of size and shape.

* 3.15.2 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

* 3.15.3 Bolted connections. Bolt holes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, 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. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

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

4.2.1 First article inspection. The first article inspection shall be performed on one cabinet when a first article is required (see 3.2 and 6. 2). This inspection shall include the examination of 4.4 and the tests of 4.5. The first article may be either a first production item or a standard production item from the supplier’s current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality-conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the packaging inspection of 4.6. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. All cabinets of the same type and size offered for delivery at one time shall be considered a lot for the purpose of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using tightened inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.3.1 Sampling for examination. Examination shall be based on inspection level II and an Acceptable Quality Level (AQL) of 1.5 for major defects and 4.0 for minor defects in terms of defects per hundred units.

4.3.2 Sampling for tests. Tests shall be based on special inspection level 5.4 and an AQL of 4.0 defects per hundred units.

4.4 Examination. The food warming cabinet shall be visually inspected to determine conformance with the requirements of this specification. Examination shall be conducted as specified in Table II.

TABLE I. Classification of defects.

Classification	Defects	Requirement paragraph
Major:		
101	Cabinet not type and size required; does not hold required number of pans.	(1.2)
102	Maximum overall dimensions exceeded; other dimensions not as specified.	(3.1)
103	Material not as specified; defective materials affecting usability of the units.	(3.4)
104	Cabinets of one lot not identical to the extent required to insure interchangeability of parts, components, and assemblies.	(3.5)
105	Design not in accordance with safety requirements: positive protection against electrical shock not provided.	(3.6)
106	Construction not in accordance with NSF No. 2 and NSF No. 4; exteriors not meeting construction requirements	(3.7)
107	Panels not fitted and sealed as required; insulation not of sufficient thickness; insulation not provided between sections.	(3.7.1.1)
108	Doors not hinged so as to provide full access to interior; not provided with positive action latches or spring loaded hinges; locks not provided. Hardware not of material specified.	(3.7.1.2)
109	Minimum number of shelves not provided; shelf supports not adjustable as required.	(3.7.1.3)
110	Sufficient sets of adjustable angles not furnished or not adjustable as required; angles will not accept all pan sizes specified.	(3.7.1.4)
111	Legs not adjustable or provide harborage for bacteria and dirt.	(3.7.1.5)

TABLE II. Classification of defects. (continued)

Major:		
112	Dimensions of type II and III cabinets not as specified; panels not of required thickness and material; insulation not as specified; minimum air space not provided; inner partition not provided as required; inside dimensions for type III not as specified; each compartment not provided with individual thermostat.	(3.7.2.1)
113	Construction of compartments not as specified; each section not provided with hole(s) for moisture control; compartments not equipped with sufficient brackets to provide pan capacity specified; sections not removable.	(3.7.2.1.1 3.7.2.1.2, 3.7.2.1.3)
114	Doors not fabricated as specified; automatic stops not provided; hinges not externally adjustable; door movement not restricted to 90 deg.	(3.7.2.2)
115	Base not as specified; provision not made for height adjustment.	(3.7.2.3)
116	Moisture control device not provided for each section; parts in contact with food not of corrosion-resisting steel; vents not covered; dampers not constructed as specified; pushbuttons not provided or not identified; door vent(s) not provides as specified; and positive mechanical device not provided.	(3.8.1, 3.8.1.1., & 3.8.1.2)
117	Temperature control device not capable of raising or maintaining internal temperature as specified.	(3.8.2)
118	Electrical wiring not as specified; wire, cord, and electrical components do not have UL listing, and are not installed in accordance with NFPA No. 70; wiring diagram not furnished; disconnect switch not provided, not in conformance with NFPA No. 70, and not equipped overload protective device.	(3.9)
119	Electric heating elements not of specified wattage or voltage and not as otherwise specified; elements not completely concealed; heat not directed as specified; heating elements allow cooking.	(3.9.1)
120	Thermostat not capable of regulating heat within the range of 150 deg F and 200 deg F.	(3.9.2)
121	Switch and signal light(s) missing or not specified.	(3.9.3)
122	Exterior dual-type thermometer not furnished.	(3.10)

TABLE 11. Classification of defects. (continued)

123	Insulation not of proper material; is moisture-absorbing or settles (compacts) under normal handling; allows exterior cabinet temperature to exceed ambient by more than 30 deg F with internal temperature at 200 deg F.	(3.11)
124	Identification marking or instructions plates missing or not as specified.	(3.12)
125	Fungus resistance coating of electrical circuit elements not as specified.	(3.13)
126	Workmanship not as required.	(3.15)
Minor		
201	Commercial publications missing.	(3.14)

4.5 Tests.

4.5.1 Functional test. The food warming cabinet shall be operated as required to verify that when the cabinet is installed in its intended location all electrical and mechanical components function in a manner that insures compliance with this specification.

4.5.2 Warm-up time. The cabinet shall be heated to 150 deg F from a cabinet temperature of 75 + 5 deg F. With the doors closed and without load each section shall attain this temperature wihtin 30 minutes (see 3.8.2).

4.5.3 Performance test. With the temperature control set at 175 deg F, the cabinet shall be operated for 10 hours. Internal temperature readings shall be recorded at 15-minute intervals. Failure of the unit to maintain conditions within 10 deg F of the control setting over a period of 2 hours shall be cause for rejection. Additional tests of 2 hours duration shall be conducted at control settings of 200 deg F. During the 200 deg F test, the temperature of each exterior surface (less bottom) shall be taken at three widely separated points at 30 minutes interval to insure that the cabinet meets the conditions specified (3.11).

4.6 Packaging inspection. The inspection of the preservation, packing, and marking shall be in accordance with the requirements of section 4 of MIL-B-2316.

5. PACKAGING

5.1 Preservation, packing, and marking. Preservation, packing, and marking shall be in accordance with the requirements of MIL-B-2316 with the level of preservation and the level of packing as specified (see 6.2).

6. NOTES

6.1 Intended use. Stationary food-warming cabinets covered by this specification are intended for use in food preparation areas of consolidated messes, dining halls, and hospitals of the Navy, Army, and Air Force. The cabinets are designed to facilities servings during peak feeding periods by maintaining food at proper temperature. Food from the kitchen is usually inserted through the cabinet door(s) of one side and removed in the dining area through the door(s) of the other side. The warming cabinets are not intended to be used for cooking or reheating cool or cold food.

6.2 Ordering data. Purchases should exercise any desired options offered herein and acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Type and size required (see 1.2).
c. When maximum overall dimensions for the type II and III cabinets shall be different (see 3.1).
d. When a first article is required (see 3.2, 4.2.1, and 6.3).
e. Whether the exterior of door frames and panels is different (see 3.7).
f. When the bottom exterior shall be corrosion resistant steel (see 3.7).
g. When door locks for type I cabinets are required (see 3.7.1.2).
h. Whether removable shelves for type I cabinets are required, and the number of shelves per section (see 3.7.1.3).
i. When adjustable angles are required (see 3.7.1.4).
j. When sizes 15, 18, 36, and 54 cabinets shall be supported by an enclosed base (see 3.7.1.5).
k. Whether the cabinet support is different (see 3.7.1.5).
l. When type II and III cabinets shall be pass-through or reach-in (see 3.7.2).
m. Whether electrical characteristics are different (see 3.9).
n. When sizes 36 and 54, and types II and III cabinets shall be wired for CONUS or for European use (see 3.9).
o. When a disconnect switch is required (see 3.9).
p. When the resistance of the heating elements shall be decreased for sizes 36 and 54 and for type II and III cabinets (see 3.9).
q. When each section shall be furnished with an exterior, dial-type thermometer (see 3.10).
r. When national stock number and contract number are not required (see 3.12).
s. When fungus resistance coating of electrical circuit elements is required (see 3.13).
t. Level of preservation and level of packing required (see 5.1).

6.2.1 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL) and invokes the provisions of paragraph 7-104.9(n) of the Defense Acquisition Regulations (DAR), the data requirements will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL (DD Form 1423) incorporated into the contract. When the provisions of DAR 7-104.9(n) are not invoked, the data shall be delivered in accordance with the contract requirements.

6.3 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor’s current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This were done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, irrespective of the marginal notations an relationship to the last previous issue.

Custodians:

Army - GL
Navy - YD
Air Force - 99

Review activities:

Army - MD
Navy - MS
DLA - GS

User activities:

Army - CE
Navy - MC

Preparing activity:

Navy - YD

Project No. 7310-0675

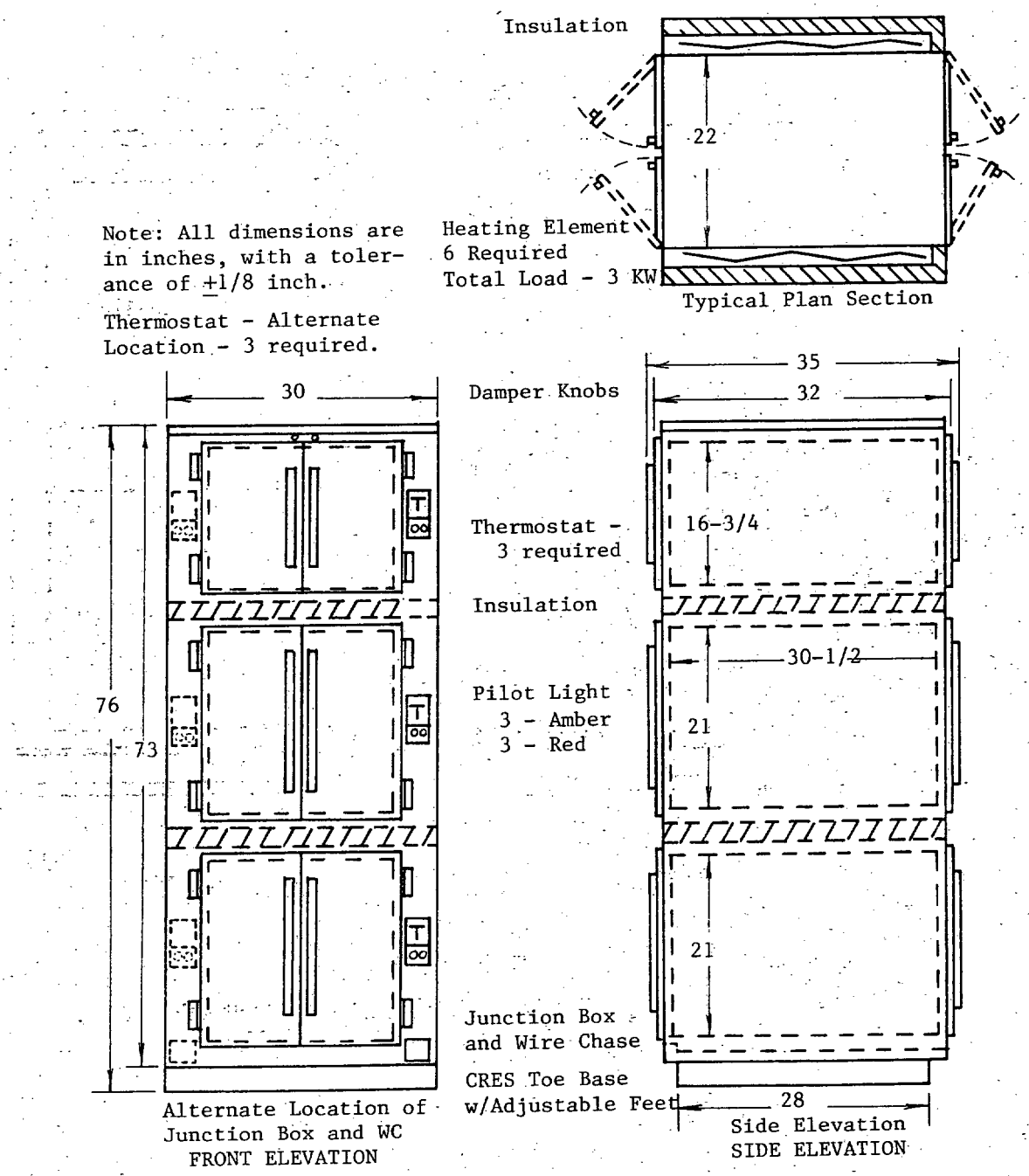

FIGURE 1. Type II food warming cabinet

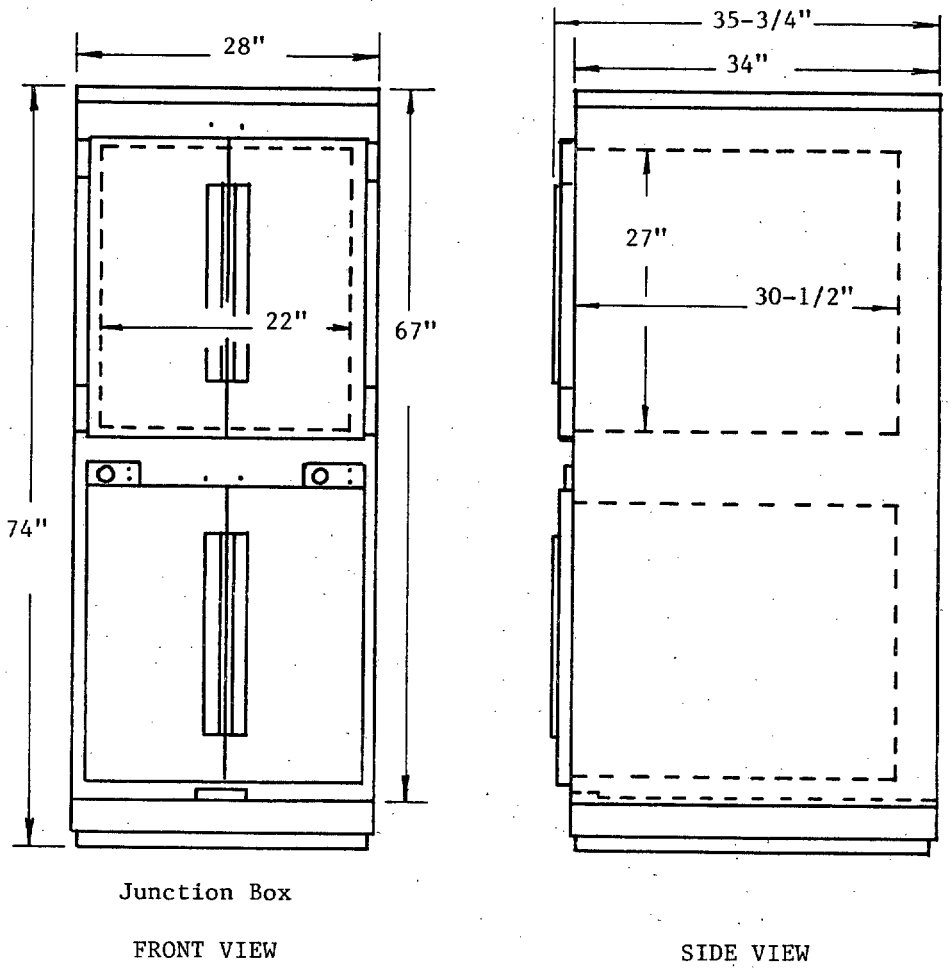

FIGURE 2. Type III food warming cabinet

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side) Project No. 7310-0675

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-C-23880D	CABINETS, FOOD WARMING, ELECTRIC, PASS-THROUGH AND REACH-IN

3a. NAME OF SUBMITTING ORGANIZATION

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

4. TYPE OF ORGANIZATION *(Mark one)*

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

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

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

b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional

c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional

8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426 PREVIOUS EDITION IS OBSOLETE.