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SUPERSEDING
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FEDERAL SPECIFICATION

KETTLES, STEAM-JACKETED (STAINLESS STEEL), GAS

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal Agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers stainless steel, steam-jacketed kettles directly heated by gas.

1.2 Classification. Kettles shall be of one type in the following sizes, as specified (see 6.2):

Size 1 - 20-gallon capacity
Size 2 - 40-gallon capacity
Size 3 - 60-gallon capacity

2. APPLICABLE DOCUMENTS

2.1 Government publications. The following documents of the issues in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

Federal Specifications:

PPP-B-601	- Boxes, Wood, Cleated-Plywood
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	- Boxes, Shipping, Fiberboard
PPP-T-60	- Tape: Packaging, Waterproof

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 7310

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

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Federal Standard:

FED-STD-123 - Marking for Shipment (Civil Agencies)

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements, as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Single copies of this specification and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from the General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.)

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specification:

MIL-C-104 - Crate, Wood, Lumber and Plywood Sheathed,
Nailed and Bolted

Military Standards:

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	- Marking for Shipment and Storage
MIL-STD-130	- Identification Marking of US Military Property
MIL-STD-1186	- Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; with Appropriate Test Methods

(Copies of military 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 a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM)

- A 176 - Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip
- A 240 - Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
- A 285 - Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength
- B 584 - Copper Alloy Sand Castings for General Applications
- D 3951 - Standard Practice for Commercial Packaging

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

American Gas Association (AGA)

Directory of Certified Appliances and Accessories

(Application for copies should be addressed to the American Gas Association, 8501 East Pleasant Valley Road, Cleveland, OH 44131.)

American National Standards Institute (ANSI)

- Z83.15 - Gas Food Service Equipment - Kettles, Steam Cookers, and Steam Generators

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

American Society of Mechanical Engineers (ASME)

Boiler and Pressure Vessel Code - Section VIII, Unfired Pressure Vessel Code

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

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National Sanitation Foundation (NSF)

Standard No. 4 - Commercial Cooking and Hot Food Storage Equipment

Current Listing of Food Service Equipment

(Applications for copies should be addressed to the National Sanitation Foundation, 3475 Plymouth Road, Ann Arbor, MI 48105.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard product. Kettles shall be the manufacturer's standard commercial products except for any changes specified herein. All kettles of the same size furnished under this specification and any one contract, including parts and assemblies thereof, must be identical.

3.2 Design. Kettles shall consist of an inner body with a steam jacket and shall be enclosed by insulation and an outer casing. Kettles shall be stainless steel and shall have minimum bowl capacities of 20, 40, or 60 gallons (see 4.4.1). Kettles shall be designed to cook, simmer, or keep food warm in a temperature range of 150 deg. F to not less than 256 deg. F, by means of steam generated in a steam jacket by gas firing. When tested as specified in 4.4.1.1, the 20 gallon kettle shall boil water in not less than 50 minutes, and the 40 and 60 gallon kettles shall boil water in not less than 1 hour and 20 minutes. Kettle jacket shall have a design pressure not less than 18 pounds per square inch gage (psig) and shall thermostatically operate at any steam jacket pressure in a range from vacuum up to their rated working pressure.

3.2.1 Burner unit. Gas burners shall be of sufficient BTU per hour rating to meet the maximum time to bring water to boil when tested as specified in 4.4.1.1.

3.3 Codes and standards. Kettles covered herein shall conform to applicable requirements of ANSI Z83.15, the ASME Boiler and Pressure Vessel Code, and NSF Standard No. 4, as applicable (see 4.3).

3.4 Materials and components. Materials and components shall be as specified herein. Materials not specified shall be of the quality normally used by the manufacturer in his standard commercial gas fired kettles (see 6.3).

3.4.1 Stainless steel sheet and strip. Stainless steel sheet and strip shall conform to type 302, or 304 of ASTM A 240 or type 430 of ASTM A 176. Stainless steel type 430 shall be limited to use in the outer casing.

3.4.2 Carbon steel. Carbon steel shall conform to ASTM A 285.

3.4.3 Insulation. Insulation shall be fibrous glass felt with a nominal rated density of 3 pounds per cubic foot.

3.4.4 Castings. Castings shall not have cracks, be porous, or have blowholes or other casting imperfections.

3.4.5 Pipe. Pipe shall be Iron Pipe Size (IPS) with National Taper Pipe (NTP) threaded ends. Pipe for water connections shall be seamless brass, standard weight. Pipe for gas connections shall be iron, black, standard weight.

3.4.6 Pipe-fittings. Pipe-fittings used with brass pipe shall be bronze, rated at 125 pounds per square inch (psi). Pipe-fittings used with iron pipe shall be black, malleable iron rated at 150 psi.

3.4.7 Valves. Globe valves and gate valves shall be designed for use with saturated steam, and the valve bodies shall have threaded ends. The valves shall be the standard commercial items of the manufacturer for use with any steam working pressure up to 125 psi. The steam working pressure shall be cast on the side of the valve body.

3.4.8 Copper alloy castings. Copper alloy castings shall conform to classification 976 of ASTM B 584.

3.5 Construction. The steam-jacketed kettles shall be constructed as specified herein and with dimensions as specified in table I. Material thickness specified herein as "nominal" are not intended to preclude heavier gage materials.

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TABLE I. Dimensions in inches

Measurement	Gallons		
	20	40	60
Height to top rim of kettle, max	42	45	47
Clearance between drawoff outlet and floor, min	14	14	14
Flue diameter, min	4	5	6
Size of gas supply pipe to kettle (IPS), min	1/2	1/2	1/2
Swing spout water valve and spout size (IPS), min	1/2	1/2	1/2
Water jacket fill connection, min	1/4	1/4	1/4
Water jacket drain (IFS), min (when applicable)	1/2	1/2	1/2

3.5.1 Kettle body. The body shall be cylindrical with a hemispherical or sloping bottom and shall be fabricated from type 302 or type 304 stainless steel specified in 3.4.1. The body shall be seamless drawn from one piece of material or die formed and welded in sections. The top edge shall be flanged or welded to form a canopy and shall slope away from the body. The top of the body shall fit the flange on the cover. The bottom of the body shall be provided with an opening to the drawoff tube and shall be located to allow complete drainage.

3.5.2 Steam jacket. The outer wall and bottom head of the steam jacket shall be fabricated of carbon steel specified in 3.4.2, stainless steel specified in 3.4.1, or firebox quality boiler plate, as applicable. The jacket shall be formed of one piece or welded in segments, and the top shall be welded to the body. The drawoff tube shall pass through the steam jacket and shall be welded thereto to form a leakproof joint. The jacket shall be provided with a water fill point and with additional valving conforming to the applicable requirements of ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessel Code.

3.5.3 Casing. When specified (see 6.2), the body and steam jacket shall be enclosed by a cylindrically shaped casing designed so that it can be removed. The top of the casing shall terminate at the canopy and shall be attached thereto, and the bottom shall terminate below the steam jacket and shall conceal the gas burner. The casing shall consist of an inner and outer liner separated by insulation conforming to 3.4.3. Insulation shall be applied so as to fill all voids between the two liners. The inner liner shall be formed from 18 gage (0.050-inch) thick stainless steel or 16 gage (0.0598-inch) thick carbon steel sheet, or electro galvanized metal. The outer liner shall be formed from 18 gage (0.050-inch) thick stainless steel sheet specified in 3.4.1. Carbon steel reinforcing rings shall be provided to separate the inner and outer liners of the casing. The reinforcing rings shall be fabricated from minimum 1-inch by 1-inch by 1/8-inch angle, rolled to the radius of the kettle and welded to the outer casing. The stainless steel canopy specified in 3.5.1 shall center the kettle within the casing. The top of the outer casing shall be attached to the canopy by stainless steel screws. Two sheet-steel flame baffles shall be located inside the casing, opposite each other, one under the flue and one above the fire door. One flue connection of the size specified in table I shall be built into each casing. A hinged outward opening door shall be provided for access to the gas burner. The kettle shall be supported on three stainless steel legs with 1-inch adjustable feet attached to the underside of the bottom reinforcing ring.

3.5.4 Bottom plate. The bottom plate shall be fabricated from 18 gage carbon steel (0.047-inch) or stainless steel (0.050-inch) thick sheet. The bottom plate shall be provided on the underside of the kettle. The plate shall cover the bottom of the kettle to the edge of the casing and shall be secured thereto. The plate shall have an opening to allow removal and replacement of the burner. Circular holes to permit air for combustion shall be provided in the plate when the kettle design requires admission of air at this point.

3.5.5 Covers. Covers shall be formed from stainless steel specified in 3.4.1 and shall be a minimum of 0.050 inch thick. The covers shall fit the radius at the top edge of the kettle body. Covers shall be flanged, dished, or reinforced to prevent distortion or permanent set as a result of normal use.

3.5.5.1 One-piece cover. The 20 and 40 gallon kettles shall be provided with a one-piece hinged cover. The hinges shall be the offset-type located at the back or side of the kettle. The cover shall have a handle conforming to 3.5.5.3. When a one-piece cover is provided for the 60 gallon kettle (see 6.2), one or more stainless steel actuators with fully enclosed counter-balance springs shall be provided.

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3.5.5.2 Two-piece cover. Unless otherwise specified (see 3.5.5.1 and 6.2), the 60 gallon kettle shall have a two-piece cover. The two-piece cover shall have two offset hinges at the back of the kettle and two hinges located beyond the centerline of the kettle and shall be secured with either a continuous fillet weld or spot welds on 1-inch centers. The cover shall have a gutter approximately 1 3/8 inches in from the outer edge or may have other means to prevent condensation from dripping into the kettle body. Each section of the cover shall open at least 110 degrees from the closed position and shall rest in this position on stops provided on the back of the center hinges. The back section of the cover shall also be movable and shall be capable of turning up-and-back on the offset hinges. A sanitary shield shall be located at the rear of the front section, and the front edge of the back section shall be flanged-up to prevent dirt and foreign matter from entering the kettle through the hinged joints.

3.5.5.3 Handle. Each cover shall be provided with a raised handle made of stainless steel bar stock or tubing. A plastic knob may be provided on the handle. The handle shall be located so the cover can be raised without the attendant's arm passing over the open kettle. The handle shall be secured to the cover in accordance with the manufacturer's standard practice.

3.5.6 Drawoff assembly. The kettles shall be provided with drawoff assembly located tangent with the lowest point inside the body. The assembly shall consist of the tube specified in 3.5.6.1 and the valve specified in 3.5.6.2. The tube shall have an outside diameter of not less than 1 1/2 inches, and the valve shall be nominal 1 1/2 inches in size. When specified (see 6.2), the drawoff tube and valve for the 20, 40, and 60 gallon capacity kettles shall be nominal 2 or 3 inches in diameter and size, respectively.

3.5.6.1 Tube. The drawoff tube shall be of a one-piece seamless, stainless steel tube construction and shall be welded to the bottom of the body and to the steam-jacket where the tube pierces it. The tube shall not contain any kinks, and all bends shall be of a uniform radius and shall be flush with the round opening in the drawoff valve.

3.5.6.2 Valve. The drawoff valve shall be a sanitary, angle, compression-disk type or plug type fabricated of copper alloy specified in 3.4.8 or type 304 stainless steel. The valve shall be soldered to the drawoff tube by means of a recessed sanitary joint. The stem of the 1 1/2- or 2-inch valve shall be provided with a fiber-impregnated plastic handle not less than 2 1/8 or 3 inches in diameter, respectively. The 3-inch valve shall have a wheel type metal handle not less than 5 inches in diameter or a bar type handle of not less than 5 inches in length. The valve shall be so designed that it can be taken apart without the use of tools. Threads for the drawoff valve shall be of standard sanitary design.

3.5.7 Outlet strainer and strainer hook. The drawoff outlet of the kettle body shall be protected by a removable strainer fabricated of stainless steel specified in 3.4.1. The strainer shall be perforated with nominal 1/4-inch diameter holes located on maximum 9/16 inch centers and shall be welded to a stay which shall extend downward and fit snugly into the outlet fitting. A stainless steel strainer hook with a loop or tee handle shall be provided for removal of the strainer and shall be made from nominal 3/16 inch diameter rod, 6 inches longer than the overall inside depth of the kettle body.

3.5.8 Safety valve. Each kettle shall be provided with an attached pressure-type, brass, safety valve constructed in accordance with the applicable requirements of ASME. The valve shall be set at the factory in accordance with the ASME Boiler and Pressure Vessel Code for the maximum working pressure of the kettle.

3.5.9 Pressure gage. A dial type pressure gage shall be of the compound vacuum-pressure type or pressure type and shall be located in an opening in the control housing (see 3.5.12) so that the dial is visible. The compound vacuum-pressure type shall have a range from full vacuum to 0 and from 0 to a pressure not less than 1 1/2 times the full working pressure of the vessel. The pressure type shall have range from 0 to a pressure not less than 1 1/2 times the full working pressure of the vessel.

3.5.10 Water level gage. Each kettle shall be equipped with a removable glass gage to indicate the water level in the steam jacket. The gage glass shall be marked to indicate maximum and minimum operating levels, or the gage shall be so located that, when water is visible at the lowest point in the glass, sufficient water shall be in the jacket to protect the jacket and elements. Gage glass and fittings shall be suitable for the design pressure specified. The gage shall be provided with the glass visible to the attendant and shall be protected against accidental breakage.

3.5.11 Swing-spout. Unless otherwise specified (see 6.2), a swing-spout water supply connection shall be provided. The spout shall be either a combination swing-spout with faucet or a swing-spout with globe valve. The spout shall be the manufacturer's standard design and shall be chrome-nickel-plated brass or stainless steel. The assembly shall be mounted on a minimum 16 gage thick stainless steel bracket securely attached to the right side of the kettle when facing the drawoff valve. The bracket and swing-spout shall be so positioned that the outlet end of the spout has a 1 1/2 inch minimum clearance above the top rim of the kettle. When a faucet is not an integral part of the swing-spout, a globe valve conforming to 3.4.7 of the same size as the water inlet connection shall be inserted directly below the swing-spout bracket assembly. The spout outlet shall be provided with an aerator.

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3.5.12 Control location. The steam pressure control, automatic pilot valve, and magnetic gas valve shall be located either in an insulated recess at the bottom of the casing or in a protective hood on the outside of the casing. Material for both methods of construction shall be stainless steel specified in 3.4.1. When the controls are located in a recess, a cover attached to the casing by stainless steel sheet metal screws shall be provided. When the controls are located on the outside of the casing, a protective housing shall be provided and shall consist of a top, front, and sides designed to prevent spillage from the kettle from entering the housing. The hood either shall be an integral part of the casing or shall be attached to the casing by welding or stainless steel metal screws.

3.5.13 Fuel system. The fuel system shall be designed to burn natural and liquefied petroleum gas. Burner gas valves and pilot gas valves shall be of the fixed orifice type with interchangeable orifice hoods or bushings. Each kettle shall have two orifice hoods or orifice bushings: one orifice hood drilled for natural gas and the other orifice hood drilled for liquefied petroleum gas. The hoods or orifice bushings shall be color coded as follows: (1) natural gas - unpainted brass and (2) liquefied petroleum gas - black. The manufacturer shall provide instructions for conversion from any one type of gas to the other.

3.5.13.1 Main gas valve. The main gas valve shall be a manually operated, plug-cock type.

3.5.14 Electrically operated controls. Unless otherwise specified (see 6.2), electrically operated controls, as required, shall be suitable for operation on a nominal 120-volt, 60 hertz (Hz), single-phase system voltage. Transformers may be used to adapt current with these characteristics to actual requirements for operation and shall be supplied by the manufacturer, as required.

3.5.14.1 Steam-pressure control. The steam-pressure control shall be an electrically-operated mercury switch or bellows-type. The mercury-switch control shall have an operating range of at least 10 inches of mercury on the vacuum side to 30 psi on the pressure side. A solenoid valve shall shut off the gas supply to the main burner whenever the jacket pressure is exceeded (see 4.4.2.).

3.5.14.2 Low water cutoff. The kettle shall be provided with a low water cutoff. The cutoff may be either a float type or an electrically-operated probe and relay type. The cutoff shall be designed to operate on the water level in the kettle jacket and, when tested as specified in 4.4.2, shall automatically cut off the main burner gas supply when the water level in the gage drops below the minimum marking or below the lowest visible portion of the gage glass, as applicable. The low-water cutoff may be either a manual

reset or an automatic reset type. The float chamber of the float type cutoff shall be separated from the switch and operating mechanism by a bellows or other packless device. The cutoff shall be rated for use in pressures up to 40 psi. The switch electrical contacts shall be enclosed in a control box. The relay of the probe and relay type of cutoff shall be mounted on the kettle or be suitable for well mounting.

3.5.14.3 Thermostat. The thermostat shall be a single-pole or double-pole, single-throw type, which shall automatically control temperature in the water jacket and kettle body when selected temperature is attained. The thermostat shall have a minimum operating range of 150 deg. F to not less than 240 deg. F and shall be marked with an "OFF" position. An indicating light shall show that the thermostat is energized. The thermostat shall indicate temperature in cooking area within +/- 10 deg. F of thermostat setting (see 4.4.3).

3.6 Marking. Identification markings and operating instructions shall be permanently marked directly on the item or an attached photosensitive, embossed, or engraved aluminum, brass, or stainless steel plate(s).

3.6.1 Civil agencies. Unless otherwise specified (see 6.2), the manufacturer's standard nameplate shall be provided.

3.6.2 Data name plate. The steam kettle shall be furnished with a data name plate in accordance with the applicable requirements of MIL-STD-130 except for the following requirements: (a) Methods of applying, (b) Identification tags, (c) Information not required, and (d) Optional marking information shall not apply. The data name plate shall be made of minimum 20 gage corrosion-resisting metal and attached to the steam kettle by rivets, screws, or by welding, in such a manner as to meet the applicable National Sanitation Foundation requirements for this equipment. The plate shall bear the following information, which shall be stamped, engraved, or applied by photosensitive means:

- National stock number
- Procurement instrument identification number
- Specification data
- Manufacturer's name, address, and telephone number
- Supplier's name, address, and telephone number (list only if different from manufacturer)
- Manufacturer's model number
- Government approved manual number (see 6.2)

Each plate shall be placed so as to be readily visible to the operator during normal operation and use, and so as to not adversely affect the life or utility of the steam kettle.

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3.6.3 Instruction. Each kettle shall be equipped with a user's instruction plate permanently fastened to the outside front and shall contain the following information:

STEAM-JACKETED KETTLE

USER'S INSTRUCTIONS

1. Do not tamper with or obstruct safety valve.
2. Wash kettle before and after use with hot soapy water and rinse inside thoroughly without allowing water to enter into control housing. Dry thoroughly inside and outside.
3. Leave cover open when not in use.
4. Never turn on gas unless level of water recommended by manufacturer is observed in gage glass.
5. Do not put water in hot dry kettle.
6. When heating a cold kettle, allow the kettle to become warm before full pressure is applied. After kettle becomes warm, and before applying full pressure, open the safety valve momentarily to release any air trapped within the jacket.
7. Clean strainer, drawoff valve, and drawoff tube thoroughly after each use in accordance with manufacturer's recommendations.

3.7 Repair and maintenance. Provisions shall be made to allow for ready adjustment, service, and replacement of burner unit, valves, and controls. In addition, there shall be free access to inspect, service, and adjust any component or equipment as provided for by this specification or as indicated by the component or equipment manufacturer, without requiring disassembly of any other major component or equipment on the kettle.

3.8 Finish. All exposed stainless steel on the kettle, kettle interior, cover, and stand shall be given a finish similar to a No. 4 standard polish. The low water cutoff shall have the manufacturer's standard finish, and the safety valve and other exposed metal components and fittings not fabricated of stainless steel shall be nickel-chrome-plated in accordance with the manufacturer's standard commercial practice.

3.9 Workmanship. All components and assemblies of the kettles shall be free from dirt and other harmful extraneous material; burrs; slivers; rough die, tool, and grind marks; dents; and cracks. Castings and molded parts, if used, shall be free of sand, fins, pits, blowholes, and sprues. External surfaces shall be free from sharp edges and sharp corners.

3.9.1 Metal fabrication. Metal used in the fabrication of the kettles shall be free from kinks. Forming and shearing shall not cause damage to the metal and shall be free from trimming marks.

3.9.2 Welding. The surfaces of parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall be smooth and free from cracks, burn holes, undercuts, or incomplete fusion. All scale and flux shall be removed from the finish weld area.

3.9.3 Fastening devices. Holes punched or drilled shall be free of burrs. Threaded fasteners shall not be broken, cracked, or stripped and shall be drawn tight. Rivets shall fill the hole completely, and the heads shall be in full contact with the surface of the member.

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 this document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirement in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for assuring that all specified dimensions have been met. When dimensions cannot

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be examined on the end item, inspection shall be made at any point or at all points in the manufacturing process necessary to assure compliance with all dimensional requirements.

4.2 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.2.2 In-process inspection. Inspection shall be made on all casings to determine that installation of insulation conforms to the requirements of 3.5.3. Whenever nonconformance is noted, correction shall be made on the affected items and process.

4.2.3 End item visual examination. The end item shall be examined for the defects listed in table II. The lot size shall be expressed in units of kettles. The sample unit shall be one completely fabricated kettle. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 6.5 for total (major and minor combined) defects.

TABLE II. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Finish	Type of finish not as specified	101	
	Peeled or chipped (plated finishes)	102	
	Not finished where required	103	
Construction and workmanship (general)	Any rough or sharp edges, burrs, slivers or scratches; rough die or grind marks	104	
	Any component bent, buckled, damaged, fractured, malformed, or punctured	105	
	Any component missing, loose, or not in proper alignment	106	
	Any functioning component that requires abnormal force to operate		201

TABLE II. End item visual defects - Continued

Examine	Defect	Classification	
		Major	Minor
Construction and workmanship - continued	Any adjustable assembly that cannot be adjusted	107	
	Any adjustable assembly not properly adjusted to perform the intended function		202
	Parts not connected or joined as specified or poorly accomplished	108	
	Any component not readily accessible for servicing, where required		203
Soldering	Not adherent	109	
	Incomplete (areas not soldered)	110	
	Not clean (flux or flux residue not removed), not smooth, or with pinholes	111	
Welding	Not type specified, incomplete, burn holes, cracked, fractured, or not fused	112	
	Slag inclusion, slight undercut, not smooth and uniform, scale or flux deposits not removed	113	
Rivets (if applicable)	Broken, or inadequately peened	114	
Threaded fasteners	Broken, stripped, or fractured	115	
Detailed construction			
Body	Top edge not as specified	116	
	Top of kettle body does not fit cover flange	117	
	Canopy does not slope away from kettle body	118	
	Drawoff tube opening not located as specified	119	

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TABLE II. End item visual defects - Continued

Examine	Defect	Classification	
		Major	Minor
Detailed construction - continued			
Casing	Not secured to canopy as specified	120	
	Flame baffles not located as specified	121	
	Access door not as specified	122	
	Flue connection not as specified	123	
	Air holes missing in bottom plate (when required)	124	
Bottom plate	Opening in bottom plate not as specified	125	
Legs	Not type or number specified	126	
Covers	Hinges not as specified	127	
	Gutter not provided or not as specified (when applicable)	128	
	Stops not provided as specified (two-piece cover)	129	
	Sanitary shield not located as specified (two-piece cover)	130	
	Handle not as specified	131	
Drawoff tube	Not fabricated as specified	132	
	Not flush with opening in valve	133	
	Tube does not contain uniform radius	134	
	Tube contains kinks	135	
Drawoff valve	Handle not type specified		204
	Not disassembled without tools	136	
Strainer and hook	Strainer not perforated as specified	137	
	Stay not snug fit in outlet	138	
	Handle not as specified		205
Safety valve	Not tagged as specified	139	
	Not capable of 360 degree rotation	140	
	Not connected to steam-jacket as specified	141	

TABLE II. End item visual defects - Continued

Examine	Defect	Classification	
		Major	Minor
Detailed construction - continued			
Gages (water level and pressure)	Not as specified	142	
	Not located as specified		206
	Water level gage not protected	143	
Swing-spout (when applicable)	Not as specified	144	
	Bracket not as specified or not located correctly	207	
	Clearance between outlet end of spout and top rim of kettle not 1 1/2 inch minimum (check visually, measure if in doubt)	145	
Fuel system and controls	Burner manifold cracked	146	
	Number of hoods not as specified	147	
	Burner supports not secure		208
	Automatic pilot not provided with a 100-percent shutoff device	148	
	Burner connection loose		209
Instruction plate	Incomplete, not legible	149	
	Omitted, not specified type, or not in proper location		210
Data name plate	Omitted or not as specified		211
	Information incomplete or illegible		212
	Not located so as to be readily visible to operator		213

4.2.4 End item dimensional examination. The end item shall be examined for conformance to the dimensions specified in table I. Any dimension exceeding the specified maximum or less than the specified minimum shall be classified as a defect. The lot size shall be expressed in units of kettles. The sample unit shall be one completely fabricated kettle. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 4.0.

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4.2.5 End item testing. One production unit from the initial production lot shall be tested as specified in 4.4.1, 4.4.1.1, 4.4.2, and 4.4.3. Failure of any test shall be cause for rejection of the inspection lot.

4.2.6 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

Examine	Defect
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application
Materials	Any component missing, damaged, or not as specified
Workmanship	Inadequate application of components, such as incomplete sealing or closure of flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container
Content	Number of intermediate containers is more or less than specified

4.3 Certification compliance examination. Certifications, certified test reports, or listing marks for codes and standards, as applicable, submitted in accordance with 3.3, shall be examined and validated as proof of compliance.

4.3.1 American National Standards Institute. Acceptable evidence of meeting the applicable requirements of ANSI Z83.15 shall be a reproduced copy of the American Gas Association (AGA) Appliance Certificate, a listing of the kettle in the AGA "Directory of Certified Appliances and Accessories", or a certified test report from a recognized independent testing laboratory acceptable to the Government stating that the kettles have been tested and conform to the applicable requirements of ANSI Z83.15.

4.3.2 American Society of Mechanical Engineers. Acceptable evidence of meeting the applicable requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure shall be one of the following:

- a. A display of the ASME stamp on the finished kettle.
- b. A certified test report from a recognized independent testing laboratory acceptable to the Government certifying that the jacketed sections of the kettles have been tested and conform to all the applicable requirements of the ASME Boiler and Pressure Vessel Code -- Section VIII, Unfired Pressure Vessel Code.

4.3.3 National Sanitation Foundation. Acceptable evidence of meeting the requirements of National Sanitation Foundation shall be one of the following:

- a. A listing in the current edition of the National Sanitation Foundation "Current Listing of Food Service Equipment" and display of the NSF seal on the finished kettle.
- b. A certification for the kettle issued by NSF under their special one-time contract evaluation/certification service.
- c. A certified test report acceptable to the contracting officer with the advice of the Army Surgeon General, from a recognized independent testing laboratory, indicating that the kettles have been tested and conform to NSF Standard No. 4.

4.4 Methods of inspection.

4.4.1 Capacity. The kettle shall be tested to determine compliance with capacity requirements of 3.2, by filling the kettle with water at 50 deg. F from a container of known capacity. Failure to comply shall be cause for rejection of the kettle.

4.4.1.1 Heating time test. The kettle, while filled to rated capacity with water at 50 deg. +/- 2 deg. F, shall have its cover put in place and the burner(s) brought into operation. At an ambient temperature of 68 deg. +/- 4 deg. F, and ambient barometric pressure of 14.7 psia +/- 1 psi, the maximum times for the water in the kettle to reach the boiling point as specified in table III shall apply. Failure to comply shall be cause for rejection of the kettle.

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TABLE III. Heating time test

Kettle capacity (gallons)	Maximum time to boil (minutes)
20	50
40	80
60	80

4.4.2 Operation. The kettle shall be tested to determine conformance with the pressure control shut-off requirements of 3.5.14.1 and the low water cutoff requirements of 3.5.14.2. Failure to comply shall be cause for rejection of the item.

4.4.3 Thermostat accuracy. The kettle shall be two-thirds filled with water. The thermostat shall be set at 200 deg. F and the burner ignited. After three "ON-OFF" cycles of the thermostat, the temperature in the cooking area shall be taken to determine conformance with thermostat accuracy requirements of 3.5.14.3. Failure to comply shall be cause for rejection of the item.

5. PACKAGING

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

5.1.1 Level A.

5.1.1.1 Disassembly. The outlet strainer and the gas burner, if possible, shall be removed from each kettle.

5.1.1.2 Kettle. The cover of each kettle shall be closed and sealed to the kettle, and all openings into pipes and valves shall be sealed with tape conforming to classification optional of PPP-T-60. Any parts of the kettle that are free to move shall be secured in place to prevent movement during transit. The feet shall be adjusted to the minimum dimension.

5.1.1.3 Components. Any disassembled components shall be unit packed in a fiberboard box conforming to style optional, type CF or SF, class weather-resistant or domestic, as applicable level dictates, of PPP-B-636.

Contents shall be immobilized and prevented from contacting each other by the use of fiberboard inserts or other cushioning material in such a manner as to prevent damage during transit. Each box shall be securely closed in accordance with the appendix of PPP-B-636.

5.1.2 Commercial. Kettles shall be preserved in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, or Commercial, as specified (see 6.2).

5.2.1 Level A packing. Each kettle, 60 gallons or less, preserved as specified in 5.1, shall be securely blocked, braced, or anchored within a shipping container conforming to overseas type of PPP-B-601 for a type 3 load or class 2, style 2 of PPP-B-621 for a type 3 load. Packing, blocking, bracing, anchoring, and cushioning procedures shall conform to the requirements of MIL-STD-1186. The fiberboard box containing disassembled components shall be class weather-resistant, waterproofed by means of tape in accordance with the appendix of PPP-B-636, and secured in an unused portion of the shipping container. Each shipping container shall be closed and strapped in accordance with the applicable container specification.

5.2.2 Level B packing. Each kettle, 60 gallons or less, preserved as specified in 5.1, shall be packed as specified in 5.2.1.1, except that the shipping container shall conform to domestic type, style A or B of PPP-B-601, or class 1, style 2 of PPP-B-621 and the fiberboard box, containing disassembled components, may be class domestic with waterproofing not required.

5.2.3 Commercial packing. Kettles, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking required by the contract or purchase order, unit packs and shipping containers shall be marked in accordance with FED-STD-123 or ASTM D 3951, as applicable.

5.3.2 Military requirements. In addition to any special marking required by the contract or purchase order, unit packs and shipping containers shall be marked in accordance with MIL-STD-129.

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6. NOTES

6.1 Intended use. Kettles are intended for use in permanent kitchens and galleys.

6.2 Ordering data. Purchasers should select the preferred options permitted herein, and procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Size of kettle required (see 1.2).
- c. When an outer casing is required (see 3.2 and 3.5.3).
- d. When a one-piece cover is required for 60 gallon kettle (see 3.5.5.1).
- e. When a 2 or 3 inch drawoff assembly is required for the 20, 40, or 60 gallon capacity kettles (see 3.5.6).
- f. When a swing-spout water supply connection is not required (see 3.5.11).
- g. Electrical characteristics if other than specified (see 3.5.14).
- h. Identification marking for civil agencies if other than stated (see 3.6.1).
- i. Number of Government approved manual (see 3.6.2).
- j. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).

6.3 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.4).

6.4 Subject term (key word) listing.

Food preparation equipment
Kettles, steam-jacketed

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MILITARY INTERESTS:

Custodians:

Army - GL
Navy - YD
Air Force - 99

Review activities:

Army - MD, TS
Navy - MS, SA
Air Force - 84
DLA - GS

User activity:

Navy - AS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS
HHS - NIH

PREPARING ACTIVITY:

Army - GL

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