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INTERIM FEDERAL SPECIFICATION

DISPENSER, DRINKING WATER, MECHANICALLY COOLED

This Interim Federal Specification was developed by General Services Administration, Federal Supply Service, Washington, D. C., 20407, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above. The General Services Administration has authorized Federal agencies to use this Interim Federal Specification as a valid exception to Federal Specification OO-C-566c, dated January 18, 1954, and Interim Federal Specification OO-C-00566d, dated January 30, 1963.

1. SCOPE AND CLASSIFICATION

1.1 Scope. The mechanically cooled drinking-water dispensers of this specification are electrically operated drinking-water coolers of the bottle, number, cafeteria, and non-circulating individual remote style, refrigerated by electrically driven mechanical condensing units. This specification also includes dispensers designed to provide both hot and cold drinking water.

1.2 Classification.

1.2.1 Types and sizes. The drinking water dispensers (coolers covered by this specification shall be furnished in the following types and sizes, as specified (see 6.2):

Types:

Type I. - Bubbler, style, air-cooled.
Type II. - Bubbler style water-cooled.
Type III. - Cafeteria style, air-cooled.
Type IV. - Cafeteria style, water-cooled.
Type V. - Remote Style, water-cooled.
Type VI. - Bottle style, air-cooled.
Type VII. - Bubbler style, air-cooled, high ambient temperature.

Size	Type of dispenser	Minimum capacity (g.p.h.)
3	VI----------	2.85
5	I, II----------	4.75
10	I, II, V, VII---------	9.5
20	I, II, III, IV, V, VII	19.0
30	III, IV, V----------	28.5

1.2.2 Mountings. The drinking water dispensers covered by this specification shall be furnished in the following mountings as specified (see 6.2).

1.2.2.1 Free standing. Free-standing dispensers shall be floor mounted with pipe connections terminating at the rear of the cabinet as specified in 3.16.

1.2.2.2 Wall flush mounted. Wall flush-mounted dispensers shall be floor mounted, installed with the rear of the cabinet flush with the building wall, with pipe connections terminating inside the cabinet as specified in 3.16.

1.2.2.3 Wall hung. Wall hung dispensers shall be designed to be supported on wall mounting brackets with pipe connections terminating inside the cabinet as specified in 3.16 and 3.4.5.

1.2.3 Refrigerating systems. If specified in the invitation to bid (see 6.2), water dispensers shall be furnished with either an open system "O", refrigeration system, or with a hermetic system. If a hermetic system is furnished, it shall be either a thermally sealed system "T" or a mechanically sealed system "M". If no refrigerating system is specified, any of the three systems may be furnished but all dispensers of the same type and size on the same contract or order, shall have the same kind of refrigerating system.

1.2.3.1 System O open. An open compressor system shall utilize a compressor equipped with a shaft sealing device and a motor external to the refrigerant circuit. Subject to the restrictions in 3.16.2, joints in the refrigerating system shall be of the soldered, brazed, welded, threaded, flanged or flared types. Compressor suction and discharge service valves with gauge connections shall be furnished. If a receiver is used, a receiver outlet valve shall be provided.

1.2.3.2 System M, hermetic, mechanically sealed. A mechanically sealed hermetic system (system M) shall contain a motor-compressor assembly enclosed either in (a) a welded or a brazed shell or in (b) a gastight shell width mechanical fastenings such as bolts or screws. In either type of mechanically sealed hermetic system, the cabinet and frame shall be so designed that the motor-compressor assembly can be readily removed for replacement or repair. Joints in the refrigerant piping system shall comply with 3.16.2. A charging connection and valve shall be incorporated in the system.

1.2.3.3 System T, hermetic, thermally sealed. A thermally sealed hermetic system (system T) shall include a motor-compressor enclosed in a welded or a brazed shell with all joints in the entire refrigeration system except motor electric terminals thermally sealed by soldering, brazing or welding. Permanent-gasketed, leak-proof electric terminals are acceptable.

1.2.4 Hot and cold water. When specified (see 6.2), the drinking water dispenser shall provide both hot and cold water facilities within the cabinet.

1.2.5 Coolers for hazardous locations. Explosion-proof or dust-tight dispensers, when specified (see 6.2), may be designated in types I, II and VI.

2. APPLICABLE SPECIFICATIONS, STANDARDS, AND OTHER PUBLICATIONS

2.1 Specifications and standards. The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification.

Federal Specifications:

CC-M-636	-	Motors Practical-Horsepower, Alternating Current.
CC-M-641	-	Motors; Alternating-Current, (Integral-Horsepower).
QQ-S-763	-	Steel Bars, Shapes and Forgings-Corrosion-Resisting.
QQ-S-766	-	Steel Plates, Sheets, and Strip Corrosion-Resisting.
WW-P-351	-	Pipe; Brass, Seamless: Iron-Pipe-Size, Standard and Extra Strong.
WW-P-404	-	Pipe, Steel (Seamless and Welded, Black and Zinc-Coated) (Galvanized).
WW-T-799	-	Tubing, Copper Seamless (For use with Solder-Joint or Flared-Tube Fittings).
GGG-P-351	-	Pipe-Threads; Taper (American-National).
UU-P-271	-	Paper, Wrapping, Waterproofed-Kraft.

PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner
PPP-B-636 - Box, Fiberboard.
PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple, Wall.
PPP-C-843 - Cushioning Material, Cellulosic
PPP-T-60 - Tape, Pressure Sensitive Adhesive, Waterproof For Packaging and Sealing.

Federal Standards:
Fed. Std. No. 102 - Preservation, Packaging and Packing Levels.
Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
Fed. Test Method St. No. 151 - Metals: Test Methods.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the price indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specifications:
MIL-P-116 - Preservation, Method of
MIL-I-16910 - Interference Measurement, Radio, Methods and Limits

Military Standards:
MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-109 - Quality Assurance Terms and Definitions.
MIL-STD-129 - Marking for Shipment and Storage.
MIL-STD-130 - Identification Marking of U. S. Military Property.

(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 otherwise indicated, the issue in effect on date of invitation for bids shall apply.

American Standards Association, Inc.
Standards:
A40.8 National Plumbing Code
B9.1 Safety Code for Mechanical Refrigeration
C1 National Electrical Code (NFBU70)

(Copies may be obtained from American Standards Association, 10 East 40th Street, New York 16, N.Y.)

American Society for Testing Materials Specifications:
B88-51 Seamless Copper Water Tube

(Copies may be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.)

U. S. Department of Commerce
Commercial Standards:
Commercial Standard CS-245-62 Vinyl-Metal Laminates.

(Copies may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington, 25, D.C.)

Underwriters' Laboratories, Inc.
Standard:
UL-399 Drinking Water Coolers.

(Copies may be obtained from the Underwriters' Laboratories, Inc., Walt Whitman Road, Melville, L.I., N. Y.; 207 East Ohio Street, Chicago 11, Ill.; or 1655 Scott Blvd., Santa Clara, Calif.)

3. REQUIREMENTS

3.1 Preproduction sample. When specified (see 6.2), before production is commenced, a sample of the time shall be submitted or made ready for approval by the contracting officer or his authorized representative. The purpose of testing the preproduction sample is to determine whether the item manufactured by the supplier has the performance characteristics required by the specification.

It is not the purpose of preproduction sample testing to determine compliance with the detailed requirements of the specification and approval of the preproduction sample does not constitute approval of the item as complying with the detailed requirements of the specifications inasmuch as each production item must comply with the detailed requirements of the specifications. The preproduction sample shall be manufactured by the supplier in the same facilities to be used for the manufacture of the production item.

3.2 Material and workmanship. All materials forming a part of the finished product shall be new, suitable for the purpose for which they are used and shall be free from all defects that may affect the serviceability and appearance of the finished product. Workmanship shall be first class.

3.2.1 Protection against damage by corrosion and electrolytic action.

3.2.1.1 Unless otherwise restricted in this specification, wherever a corrosion-resisting material or a material treated to resist corrosion is required in this specification, it shall be not more than mildly attacked after four hours exposure in a salt-spray test conducted in accordance with Fed. Test Method Std. No. 151. Corrosion-resisting steel, unless otherwise restricted in this specification shall be one of the class 300 series conforming to QQ-S-763 or QQ-S-766, whichever is applicable. Brass used for storage chambers, valve seats, pipe or tubing, pipe or tube fittings such as elbows or tees normally used with pipe or tubing, in contact with water shall contain no more than 20 percent zinc, unless plated with tin, nickel, or chromium on the surface in the contact with water. Only noncopper-bearing aluminum alloys (containing less than 0.4 percent copper) shall be used for parts fabricated from aluminum-alloy sheets or extrusions.

3.2.1.2 Materials requiring corrosion-resistance. Unless otherwise required in this specification, all metals shall be corrosion resisting or shall be treated in a manner to render them resistant to corrosion.

3.2.1.3 Retreatment after fabrication. Corrosion-resisting material shall be normalized, and material treated for corrosion resistance shall be retreated to restore or replace the corrosion-resisting properties, before being assembled in any unit when fabrication tends to reduce or remove those properties.

3.2.1.4 Protection against electrolytic or galvanic corrosion. Water dispensers furnished under this specification shall be constructed with careful attention to protection against electrolytic or galvanic corrosion. Joints between dissimilar metal which may become wetted in service shall be protected against electrolytic or galvanic corrosion by proper selections of materials, plating, isolation, insulation, paint, area relationship, gaskets or other means. All bolts, nuts, pins, screws and such other fastenings and fittings shall be of the same material as the material being joined or supported or shall be cathodic to the materials being joined or supported.

3.2.2 Refrigeration system. All materials used in construction of the refrigeration system shall be suitable for the refrigerant employed, and no material shall be used that will deteriorate due to chemical action of the refrigerant or the oil or the combination of both.

3.2.3 Chromium plating. Chromium plating as specified herein shall consist of chromium finish over a coating of nickel that has been applied directly to the base metal or over a coating of copper in accordance with the following requirements.

3.2.3.1 Plated surfaces. Plated surfaces of brass, aluminum, and zinc alloy shall be smooth, and the plating shall be done in a manner that will

produce a durable uniform finish. Plated finishes shall be bright or polished when visible on the exterior of the dispenser assembly.

3.2.3.2 Chromium, nickel, and copper coatings. Chromium finish shall be applied over a coating of nickel. The nickel coating shall be applied either direct or over a coating of copper as provided in table I below. Each coating shall completely cover all surfaces that are visible after installation, and shall conform to thicknesses shown in table I.

Table I - Thickness of chromium, nickel, and copper coatings

Base metal and finish	Minimum thickness on significant surfaces
Chromium plating on brass:	
Copper (optional, not required)	Inch
Nickel	0.00010
Chromium	.00001
Chromium plating on aluminum or zinc allow die castings:	[1]
Copper	.00030
Nickel (final nickel coating)	.00030
Nickel plus copper, total	.00075
Chromium	.00001

[1] Where the thickness of nickel equals or exceeds the thickness required for nickel plus copper, the copper coating may be omitted.

3.2.4 Leakage. Water dispensers shall not leak when tested in accordance with 4.5.9.

3.3 Construction. Requirements of American Standard A40.8, National Plumbing Code, referring to drinking water dispensers, shall apply. Where the requirements in this specification differ with the code, the more stringent requirement shall apply. Drinking water dispensers shall be self-contained and completely factory assembled except that all glass fillers; foot pedals, and automatic water regulators for type V dispensers; and external vacuum breaks may be packed separately but must be included in the dispenser shipping container for attachment at the time of installation. Refrigerant systems shall be dried, evacuated, and charged with operating requirements of refrigerant and oil. The refrigerant system, after being charged with refrigerant and oil, shall not contain moisture in excess of 35 p.p.m. as determined by testing a sample of the refrigerant in accordance with the requirements of 4.5.10. Each unit shall be provided with water-dispensing devices (except type V), insulated water-cooling unit, condensing unit, control devices necessary for automatic operation and protection, and other equipment as required in this specification or specified in the invitation to bid (see 6.2). Dispensers shall be complete, provided with electrical connection and (except type VI) shall be suitable for connecting to water-supply piping. Provision shall be made for completely draining and effectively flushing the water-containing parts of the dispenser. The compressor unit, motor, water-cooling unit and other main components do not depend on the refrigerant piping or water piping for their support. Hot water, when specified (see 6.2), shall be provided by means of an instantaneous electric heater or an electric heater controlled by an adjustable thermostat, and an insulated storage tank. The heater and storage tank shall be located within the dispenser cabinet.

3.3.1 Contamination. All parts containing drinking water, whether in low side or precooler, (if used) shall be of such design that a leak in the waste-water-containing part shall not contaminate the drinking water. In precooler or other water-containing parts at least two walls or metal shall separate the drinking water from the waste water, and the drinking-water pipe or tube shall always be on the exterior of the waste-water carrying device.

A single casting or forging used as an attachment plate for drinking-and-waste-water pipes or tubes will be acceptable, from the standpoint of protection against contamination, if a distance of not less than 1/2 inch is provided between the nearest edges of adjacent pipe-connection bosses or tube-connection bosses, and the web of metal is no thicker than 1/4 inch at any point in the projected area between bosses and provided no leaks between drinking-water and waste-water parts in the plate are observed under conditions of the hydrostatic test.

3.4 Cabinet.

3.4.1 Cabinet construction. The equipment shall be installed in a substantial steel cabinet, properly ventilated, and having a readily removable section(s) arranged so that equipment requiring inspection or adjustment shall be accessible for that purpose. No parts of the assembly shall be supported by the removable section(s) of the steel cabinet.

3.4.2 Dimensions. Unless otherwise specified in the invitation to bid (see 6.2), the height of the bubbler outlet, except for wall-hung dispensers, shall be not less than 38 inches and not more than 44 inches from the floor. Either the extreme dept or width of types I, II, VI and VII dispensers, exclusive of readily removable fixtures, shall not be greater than 25-1/2 inches; and the extreme width or depth of types III, IV, and V dispensers, exclusive of readily removable fittings, shall not be greater than 29-1/2 inches. The nozzles for glass filler on types III and IV dispensers shall not be lower than 36 inches nor higher than 54 inches from the floor.

3.4.2.1 Dimensions for wall-hung dispensers shall not exceed 19 inches in extreme width or depth and 33 inches in height, exclusive of readily removable fittings. Manufacturer's instructions (see 3.17) shall include roughing in dimensions and instructions for mounting, to keep bubblers and nozzles for glass fillers within the height limitation specified in 3.4.2.

3.4.3 Floor mounted bubbler-style, bottle-style and remote-style dispensers. Types I, II, V, VI and VII dispensers shall have either a steel base which shall be fabricated for close contact with the bottom of the cabinet shall be not less than 6 inches. If legs are not provided, the clearance between a level floor and the lower exterior edge of the base shall not exceed 3/8 inch at any point. The legs or the base shall have a corrosion-resisting finish.

3.4.4 Cafeteria-style dispensers. Type III and IV dispensers shall be supported on corrosion-resistant polished-steel adjustable legs for leveling. Clearance from the floor shall be not less than 6 inches.

3.4.5 Wall hung dispensers. Wall hung dispensers shall be furnished complete with separate steel bracket or brackets for wall mounting. The bracket(s) shall be suitable for mounting dispensers at any desired height and shall be suitable for both masonary or wood construction. Removable panel(s) shall be provided as necessary for easy access to all connections for installation and maintenance. Entrance holes or a removable plate shall be provided in the rear surface of the cabinet for entrance of all connections. Space shall be provided inside the cabinet for installation of all connections as specified in 3.14.4 and 3.16.1.

3.4.6 Flush mounted dispensers. Removable panel(s) shall be provided as necessary for easy access to all connections for installation and maintenance. Entrance holes or removable plate shall be provided in the rear surface of the cabinet for entrance of all connections. Space shall be provided inside the cabinet for installation of all connections as specified in 3.14.1 and 3.16.1.

3.4.7 Dispensers with cooling and ice storage compartments. When specified (see 6.2), floor-mounted dispensers shall be provided with cooling and ice storage compartments. Cold water capacity shall be not less than specified in the invitation to bid (see 6.2). Compartment shall hold a combination of quart and pint bottles. Ice-freezing compartment shall provide and store two trays of ice cubes. Ice cube trays shall be made of corrosive resistant metal, shall be equipped with ice cub separator grids and ejector devices and shall provide not less than one pound of ice cubes per tray.

3.5 Top.

3.5.1 Basin tops. The top of the cabinet for types I, II and VII dispensers, and for types III and IV dispensers which have top-counted glass fillers, shall have a basin equipped with bubbler(s) and/or glass filler(s) as specified in the invitation to bid (see 6.2), or as required by this specification. The strainer shall have openings not greater than 1/4-inch diameter, and, if of different material from the basin top, shall either be made of corrosion-resisting steel or chromium-plated metal. The basin shall

have rounded corners and shall be so proportioned as to prevent splashing of the bubbler stream at the minimum water flow rates specified in 3.26.1. The basin with strainer in place shall be so designed as to allow complete drainage with no accumulation of water to remain when cabinet is in operable vertical position. The basin shall be constructed of corrosion-resisting steel, unless otherwise specified in the invitation to bid (see 6.2). Tops shall be free from wrinkles and waves, and all edges and corners shall be accurately formed without sharp edges. Tops shall fit snugly and conform to the cabinet. Tops of wall hung and wall flush mounted dispensers shall have a raised edge on the back, designed to prevent water from splashing on the wall or running down between dispenser and wall.

3.5.2 Plain tops. The top of the cabinet for types V and VI dispensers and for types III and IV dispensers which have front- or side-mounted glass fillers, shall be made of the same material as the dispenser cabinet, similarly finished, or of the material listed in 3.5.1.

3.6 Drain tray. Types III and IV dispensers equipped with front-or side-mounted glass fillers and type VI dispensers shall be equipped with cleanable drain trays. Trays for types III and IV dispensers shall be constructed of metal with a corrosion-resistant finish other than organic finish. Type VI dispensers shall be provided with a substantial drain tray having corrosion-resisting surfaces and the wastewater from such dispensers shall drain off into a readily removable corrosion-resistant receptacle or not less than 1-quart capacity.

3.7 Finish. Unless otherwise specified in the invitation for bids (see 6.2), finish on the exterior surfaces of the cabinet shall consist of baked-on synthetic enamel, vinyl or equivalent air-drying lacquer applied to phosphatized steel. The air spray lacquer, if used, shall have a minimum thickness of 0.002 inch and two-coat baked-on enamel shall have a thickness of not less than 0.0015 inch. Vinyl finish, if used shall have a minimum thickness of 0.008 inch and shall meet the requirements of Commercial Standard CS245-62. The interior surfaces of the cabinet shall be rustproofed. There shall be no visible corrosion on either the interior or exterior surfaces after four hours exposure to a salt-spray test conducted in accordance with method 811 of Fed. Test Method Std. No. 151. The finish shall be durable, smooth, continuous, nonabsorbent and free from all discoloration or imperfections. The adjective "smooth" shall not preclude the use of a wrinkle-type finish were all other conditions have been met.

3.8 Bubblers. As specified in the invitation to bid, (see 6.2), or as required by this specification one or more bubblers shall be furnished on types I, II, and VII dispensers in accordance with the requirements summarized in table III.

3.8.1 Nozzle. The bubble nozzle shall be of non-oxidizing, impervious material set at an angle from the vertical such as to prevent the return of water in the jet to the orifice or orifices from whence the jet issues, and shall be capable of delivering a jet of water meeting the performance requirements of 3.26 at a minimum flow rate of 1/2 gallon per minute. The nozzle orifice or orifices and any other openings in the nozzle shall be at least 3/4 of an inch above the rim of the bowl so that such nozzle or opening cannot be flooded in case a drain from the bowl of the fountain becomes clogged. In addition, the base of the nozzle shall be located above the edge of the bowl so that it cannot be submerged in the event of drain stoppage.

3.8.2 Guard. The nozzle shall be protected by a guard designed in conjunction with the nozzle to prevent persons from directly contacting the nozzle while drinking from the dispenser, and to prevent foreign matter from dropping vertically into the nozzle. The guard shall be of such width, height, and design that users of the fountain cannot readily touch the nozzle with mouth or lips, and otherwise shall reduce to a minimum the danger of transmittal of diseases. Spaces between nozzle and guard shall be proportioned to allow convenient cleaning of these parts.

3.9 Glass fillers.

3.9.1 Glass fillers for bubbler-style dispensers. When specified in the invitation to bid (see 6.2), glass fillers shall be furnished for types I, II, and VI dispensers, in accordance with the requirements summarized in table III and 3.20, suitable for filling either an 8-ounce glass or a cylindrical vessel 6 inch in diameter and 9 inches high at a minimum flow rate of three-fourths

gallon per minute in accordance with the performance requirements of paragraph 3.26. Spilled water from the glass filler shall fall into the basin top.

3.9.2 Glass fillers for cafeteria-style dispensers. For types III and IV dispensers, glass fillers shall be provided, in accordance with the requirements summarized in table III and 3.20, suitable for filling either 8-ounce glasses or cylindrical vessels 6 inches in diameter and 11 inches high, at a minimum flow rate of one and one-half gallons per minute per glass filler in accordance with the performance requirements of 3.26. Spilled water from glass fillers shall fall into the drain tray.

3.9.3 Type VI dispensers shall be equipped with means for filling paper cups, or glasses at a minimum flow rate of one-fourth gallon per minute. Spilled water shall fall into the drain tray.

3.9.4 Dispensers that provide hot water in addition to cooled water shall be equipped with a filler for paper or china cups providing a filler minimum flow rate of 1/2 gal. per minute at 35 p.s.i for the pressure types.

3.10 Drinking-water flow controls.

3.10.1 Stop valves. For each bubbler, glass filler, faucet or other drinking-water dispensing device, a nonleaking self-closing stop valve shall be furnished. Unless otherwise specified in the invitation to bid, (see 6.2), the bubbler stop valves for types I, II, and VI dispensers shall be hand operated. This does not preclude both hand operation and foot pedal operation of the valves when it is the manufacturer's standard practice to furnish both. For types III and IV dispensers, stop valves for glass fillers shall be operated by means of contact with the vessel being filled or by foot pedal. All stop valves shall be accessible for adjustment or replacement without cutting or breaking the vapor seal of the insulation in such a manner as to require the use of heat to restore the vapor seal to its original condition and without removal of parts of the dispenser other than cover plates or detachable cabinet sections.

3.10.2 Drinking-water flow regulators. Dispensers shall be equipped with drinking-water flow regulators that will control the flow of drinking water in accordance with the requirements of 3.26. On types I, II and VII dispensers, the drinking-water regulators shall be automatic for all bubblers whereas they may be either automatic or nonautomatic for the glass fillers. On types III, IV, and V dispensers, automatic drinking-water flow regulators shall be provided to control the flow of all bubblers and glass fillers. The regulators shall be accessible for repairs without cutting or breaking the vapor seal of the insulation in such a manner that heat would be required to restore the vapor seal to its original condition. Parts of the dispenser other than cover plates or detachable cabinet sections shall not have to be removed in order to repair the drinking-water flow regulators.

3.11 Materials for drinking-water dispensing devices, guards and flow controls. Water-regulator valve and self-closing stop valve or combination of both, shall be of brass, bronze, or corrosion-resisting steel throughout, except for washers, diaphragms, etc. Glass fillers, faucets, and bubbler nozzles shall be of brass, chromium plated or of corrosion-resisting steel. Bubbler guards shall be of nonferrous metal, chromium plated, or of corrosion-resisting steel. All exposed metal parts of the water regulator valve and stop valve, exterior to the dispenser cabinet, and all exposed metal parts above the basin top, other than corrosion-resisting steel, shall be chromium plated. Foot pedals, when used with stop valves on dispensers in explosive atmospheres (see 3.19.4), shall be of nonferrous material. Handles for hot water stop valves shall be of nylon or equivalent plastic material and shall be red in color.

3.12 Cooling unit.

3.12.1 Chilled-water-storage chambers. For types I, II, VI, and VII dispensers, chilled-water storage chambers shall be constructed in the form of a tank or tube. An outlet shall be provided at the bottom of each water-storage chamber and so arranged that sediment can be readily flushed out and the chamber drained completely. The drain from the water-storage chamber shall not be directly connected to any waste line within the cabinet of the dispenser. Water-tube connections to and from the chamber shall be of the same material as to the chamber or of copper or brass. For types I, II and VII dispensers, all joints, seams, or connections to or from the water-storage chamber shall be made by silver soldering, brazing, or welding. For types III, IV, V and VI dispensers, all joints, seams, or connections to or from the water-storage chamber shall be made by silver soldering, brazing, or welding or shall be of the flanged or threaded type. Permissible materials of construction for water-storage chambers are listed in 3.12.3.

3.12.2. Water-cooling refrigerant coil. The water-cooling refrigerant coil shall either be immersed in the water-storage chamber or secured on the outside

of the water-storage chamber. Minimum wall thickness for immersion-type evaporator coils are listed in 3.12.3.1. For all types of dispensers, evaporator coils shall be constructed to readily permit the return of refrigerant oil. If coils are on the outside of the water-storage chamber, they shall be continuously bonded to the chamber, except for sections of the coil not designed to be in contact with the chamber. Coils shall be considered continuously bonded if discontinuities in the bonding do not exceed 10 percent of the coil length. Joints or immersion coils which hold the refrigerant and are in contact with the water in the storage chamber shall be constructed without threaded, flanged, or other mechanical joints. Permissible materials of construction for evaporator coils are listed in 3.12.3.

3.12.3 Materials of construction. Water-storage chambers and evaporator coils shall be made of one of the following materials. Any two materials 1 through 5 below, may be used in combination as chamber and coil.

(1) Corrosion-resisting steel containing not less than 17 percent chromium and 7 percent nickel.
(2) Copper-silicon-manganese alloy.
(3) Copper-Copper immersion-type evaporator coils shall be plated with tin, nickel, or chromium on the side in contact with water.

Copper water-storage chambers 1.125 inch or less is outside diameter shall have a minimum wall thickness corresponding to type L tubing (WW-T-799). Copper water-storage chambers larger than 1.125 inch in outside diameter shall be plated with tin, nickel, or chromium on the surface in contact with water.

(4) Brass, plated with tin, nickel, or chromium on surface in contact with water.
(5) Monel metal.

3.12.3.1 Minimum wall thickness for immersion-type evaporator coils. The minimum wall thickness for immersion-type evaporator coils shall be that shown below for the several materials permitted.

(1) Copper. As specified for WW-T-799, type K tubing.
(2) Brass. As specified for WW-P-351, extra strong pipe.
(3) Corrosion-resisting steel. As specified for A.S.T.M., type L copper tubing.
(4) Copper-silicon-manganese alloy. As specified for A.S.T.M., type L copper tubing.
(5) Monel metal. As specified for A.S.T.M., type L copper tubing.

3.12.4 Precooler. The precooler (if used) shall use the spilled water to cool the refrigerant and/or incoming water. Drain-water passages within the dispenser assembly shall be fully enclosed. Except for a water spreader at the entrance to the precooler drain tube, no internal dimension of the drain passage shall be less than 3/4 inch. In accordance with 3.3.1, two walls of metal shall separate the drinking water from the waste-water, and the drinking-water pipe or tube shall always be on the exterior of the waste-water carrying device. The precooler shall be securely mounted and shall be constructed of nonferrous metal, corrosion-resisting steel, or hot-dip galvanized iron or steel.

3.12.5 Housing and insulation. The water-cooling unit, consisting of the evaporator, storage chamber and precooler (if used), and the thermal insulation, shall be installed in a vapor-and vermin-proof enclosure within the water dispenser cabinet. The enclosure shall be formed of sheet steel except the top which shall be either sheet steel or a suitable sealing compound. Permanent panels of the cabinet may be utilized as walls of this enclosure. Sheet steel shall be either zinc coated after fabrication or otherwise protected against corrosion. Sealing compound (if used) shall be a least 3/8 inch thick, shall be free from cracks, shall have a softening temperature not less than 165 deg. F., and shall be capable of withstanding storage at 0 deg. F. without damage to its qualities as a vapor seal. All spaces between the water-cooling-unit components and the enclosures shall be filled with insulation. The minimum average thickness of the insulation shall be 1-1/2 inches of a material having a thermal conductivity of 0.30 B.t.u./hr (sq. ft.) (deg. F./inch) or any other arrangement having an equal or higher thermal resistance. At no point shall clearance between any water-cooling-unit component and a wall of the enclosure be less than 1/2 inch, except for supports and points where necessary connecting lines penetrate the housing.

3.13 Condensing unit. The condensing unit shall be either air cooled or water cooled, and shall be one of the three systems designated in 1.2.3. It shall consist of a motor, compressor, condenser, motor control, and other necessary equipment, mounted within the cabinet.

3.13.1 Compressor. The compressor shall be balanced and designed for the refrigerant employed. The oiling of all moving compressor parts shall be accomplished automatically with provision for returning oil from suction lines to housing or crankcase. A suction strainer shall be provided for systems M and O, as designed in 1.2.3, and shall be accessible for removal and cleaning. The shaft seal, on system O compressors, shall be fitted with a replaceable seal shoulder and ring.

3.13.1.1 Compressor speed. Operating speeds (r.p.m.) of compressors shall not exceed the speeds published for them by their respective manufacturers, and evidence shall be presented that such operating speeds are equaled or exceeded by compressors that have performed satisfactorily in field service for periods of a year or more.

3.13.2 Air-cooled condensers. Air cooled condensers shall be constructed of brass, copper, aluminum, or steel hot-tin dipped or otherwise protected on the outside after fabrication to resist corrosion. Fins, wires or other extensions of heat radiating surface, shall be extruded, welded, mechanically bonded or soldered to the tubing to insure permanent contact, and need not be of the same material as the tubing.

3.13.3 Water-cooled condensers. Water-cooled condensers shall be constructed with brass or copper tubes. The heat-transfer surface shall be such that the performance requirements of 3.22 are met. Water-cooled condensers shall be provided with an automatic water-regulating valve in the condenser inlet water line which shall regulate the water flow when the condensing unit is in operation and close after shutdown of the unit.

3.13.4 Water temperature controls. Automatic control of drinking water temperature shall be accomplished by:

1. Cooled water; a temperature-control switch actuating the compressor motor.
2. Hot water; a temperature control switch actuating the hot water heater.

These drinking-water thermostats shall be adjustable by means of a single knob, lever, screw, or other simple device external to the case of thermostat but this requirement for a single knob or other device shall not prohibit the use of a temperature control which may incorporate another special purpose adjusting device for adjustment by a mechanic. Adjustment range of the thermostat by means of this external device shall be large enough to fulfill the performance requirements of 3.24. The thermostat and its adjusting device shall be enclosed within the dispenser cabinet and shall be accessible for adjustment or replacement by no more than the detachment of a removable cabinet section. The temperature sensing element of the thermostat(s) shall be designed and installed in such a manner to insure accurate and reliable control. In addition, types II,IV and V dispensers shall be equipped with a high-pressure cutout to prevent compressor operation at condensing pressures in excess of appropriate high-pressure side values listed in table VII of 4.5.9.1, or if not so equipped, the entire high-pressure side of the refrigerating system shall be cable of withstanding without damage 150 percent of the maximum pressure attained when the dispenser is operated in accordance with 4.5.9.3. All controls and switches shall be accessible for adjustment or replacement without cutting or braking the vapor seal of the insulation in such a manner as to require the use of heat to restore the vapor seal to its original condition and without removal of parts of the dispenser other than cover plates or detachable cabinet sections.

3.13.4.1 Protection against damage by freezing. Dispensers shall be equipped with a temperature control, pressure control, water-pressure relief or other means which will either prevent freezing or afford protection against rupture of water containing parts or damage causing malfunction of any operating components due to freezing of water when tested in accordance with 4.5.1.

3.14 Motor and control.

3.14.1 Motors. Motors enclosed with compressors in gas-tight shells, shaded-pole motors and direct-current motors and all control equipment shall be constructed in accordance with or equal to the best commercial practice and shall be in accordance with the requirements of UL 399 in effect on date of invitation for bids. All other alternating-current motors of fractional-horse power size shall comply with CC-M-636 and if integral-horsepower size shall comply with CC-M-641. All motors and electrical equipment shall be suitable

for the voltage and current specified in the invitation to bid, (see 6.2). A transformer may be used for voltage adjustment on water dispensers employing hermetic systems for voltages other than 110-to-125 volts provided the combination of transfer and other equipment meet all the requirements of this specification. All wiring shall be protected from contact with oil or water in service, or shall be oil and water resistant.

3.14.2 Thermal protective device. Compressor motors shall be protected in case of failure of the starting mechanism, failure of the condensing medium, or excessive overload by a thermal protective device of the automatic- or hand-reset type. The device shall perform in accordance with the requirements of 3.25. Fuses are not acceptable in lieu of this thermal-overload protective device. The starting mechanism shall be simple in design and rugged in construction. Motor controllers shall be provided where required.

3.14.3 Motor-lubrication fittings. Pressure-lubrication fittings shall not be used on motors. When ball or roller bearings are used on motors for open systems, they shall be of the shielded or sealed types.

3.14.4 Electric connections. All electrical connections shall meet the requirements of UL-399 for drinking water dispensers. Unless otherwise specified (see 6.2), all cord connected dispensers shall be supplied with a 3-conductor cord, containing a green conductor which shall have one end grounded to the water dispenser frame and the other and connected to the ground terminal of the connector plug cap. The cord shall extend at least 5 feet but not more than 9 feet beyond the cabinet.

3.14.5 Radio interference suppression. If other than paleface squirrel-cage induction type, or single phase motors without commutation are used, the equipment shall comply with the requirements of MIL-I-16910 relative to radiated and conducted radio interference, when tested in accordance with 4.5.10.

3.15 Refrigerant. The refrigerant shall be one of the following types as classified in ASA-B9.1 Section 5, Group 1:

Refrigerant 12 - Dichlorodifluoromethane (CCl_2F_2).

Refrigerant 22 - Monochlorodifluoromethane ($CHClF_2$).

3.16 Piping and piping accessories.

3.16.1 Water Piping and accessories. Unless otherwise specified herein, all water-supply,remote drinking-water and waste water drain connections shall be provided with female pipe fittings having threads conforming to GGG-P-351. Water supply and remote drinking water connections and fittings shall be not less than 3/8 inch I.P.S. Waste water drain connection on fittings shall be not less than 1-1/4 inch. The waste water drain tray and basin top, except on type VI dispensers, shall be connected with the waste drain connection fitting, with a line or lines of not less than 3/4 inch internal diameter. All pipe or tubing to which external connections are made, such as glass fillers, bubblers, and service connections, shall be rigidly secured in proper position, in such a manner that when external connections are made, no damaging strain will be produced on internal pipe or tubing.

3.16.1.1 Free standing dispensers. All connections shall terminate at the rear surface of the dispenser and shall not project more than 1/2 inch beyond the cabinet. These connections shall be accessible without disassembling or removing any portion of the unit.

3.16.1.2 Flush mounted and wall hung dispensers. Flush mounted and wall hung dispensers shall have all connections terminating inside the cabinet. Drain connections shall terminate with a 1-1/4 inch O.D. tail piece at least 4 inches long suitable for a slip joint connection.

3.16.1.3 Vacuum break. For dispensers with water-cooled condensers, an internal vacuum break of the air-gap type shall be provided in the condenser-water waste line if such line is jointed to the drinking-water waste drain within the dispenser cabinet. Internal vacuum breaks shall have a one inch minimum air gap, shall be readily accessible for cleaning, shall properly drain off without splashing, and shall be of such design that if stoppage occurs in the drain line, the insulation in the cooling unit housing shall not be wetted. If the condenser-water waste line emerges from the dispenser separately from the drinking water waste drain, a readily cleanable vacuum-break assembly of adequate size, with a one inch minimum air gap and suitable for direct mounting on the rear of the dispenser if specified in the invitation to bid (see 6.2),

shall be furnished together with all fittings necessary for connecting it into the common waste line from the dispensers at the outlet of the drink-water waste drain for installation by the purchaser.

3.16.1.4 Materials for water piping. Internal water piping or tubing and fittings used to connect the various components of the water dispenser shall be copper, copper alloy, corrosion-resisting steel containing not less than 17 percent chromium-and 7-percent nickel, and shall be of sufficient strength to withstand without damage the hydrostatic-test pressure specified in 4.5.9.2. Galvanized-steel pipe shall not be used.

3.16.2 Refrigerant piping, insulation and accessories. All refrigerant pipe or tubing shall be securely supported to minimize strain and vibration. To prevent condensation, all refrigerant piping and supports not in the cooling-unit housing which attain temperature below 75 degrees F. when the dispenser is operated under the capacity test conditions of 4.5.2 shall be insulated. The insulation shall consist of a nonsweat-type pipe covering of single or double layer construction having a heat transmission rate not to exceed 1 Btu/hr. per degree F. temperature difference per square foot of pipe surface. Supports and fittings shall be covered with two or more thicknesses of 1/2 inch hair felt or equivalent insulating material, neatly fitted and secured with a final finish of waterproof asphalt emulsion which may contain asbestos fiber. Such insulation shall be inherently vapor resistant or treated to provide a vapor seal. Insulation manufacturer's certified test data indicating compliance with specific heat transmission rate will be accepted in lieu of testing. No condensed water shall run or drip from the water dispenser during acceptance testing and performance tests in accordance with 4.4 and 4.5. Unless otherwise specified in this specification, joints in refrigerant piping shall be of the soldered, brazed, welded, threaded, flanged, or flared type, and the mechanically sealed types shall be used only where readily accessible for inspection and repairs. For types I, II, VI, and VII coolers, no mechanically sealed joints shall be used within the cooling-unit housing.

3.16.2.1 Materials for refrigerant piping. Piping and fittings used to connect components in the high-pressure portion of the refrigerant circuit shall be of brass, copper, corrosion-resisting steel, monel, copper-silicon-manganese alloy, aluminum, aluminum alloy, or wrought steel protected against corrosion. Piping and fittings for use in the low-pressure portion of the refrigerant circuit shall be of brass, copper, corrosion-resisting steel, monel, copper-silicon-manganese alloy, or wrought-steel pipe protected against corrosion. Materials listed in this paragraph may be used in combination, subject to further restriction elsewhere in this specification, provided the requirements of 3.2.1.4 relative to electrolytic action are met.

3.17 Instructions for care and operation. The contractor shall furnish complete instructions for installation, maintenance and operation with each water dispenser, including complete replacement parts lists indicating manufacturer and manufacturer's part numbers with contractor's corresponding part numbers for dual identification.

3.18 Identification of product. For military procurement, the dispenser shall be marked for identification in accordance with MIL-STD-130, in addition to any other identification markings specified.

3.18.1 Nameplate data. The following information shall be marked on a suitable conspicuous nameplate:

(1) Name of organization sponsoring the completely assembled dispenser.

(2) Manufacturer's type number, model or catalog number, and serial number.

(3) Voltage and kind of current; if alternating current, the frequency and phases.

(4) The refrigerant used, expressed in chemical or other descriptive terms, and amount of refrigerant required, expressed to the nearest unit of weight critical for correct charging.

(5) Factory test pressure of refrigerant system.

3.18.2 Component-parts data. Compressors, controls, motors, and automatic

water or refrigerant flow controls and valves, shall bear the name of the manufacturer (if different from the organization sponsoring the completely assembled dispenser and sufficient additional information for replacement of parts or servicing.

3.18.3 Warming plates. Warning plates, if applicable, shall be conspicuously mounted.

3.19 Fire and casualty hazards.

3.19.1 Each contractor shall submit to the contracting agency proof that the water dispensers he proposes to supply under this specification conform to the requirements of Underwriters' Laboratories, Inc., Standard UL-399 for water dispensers. The label or listing with re-examination of the Underwriters' Laboratories, Inc., may be accepted as evidence that the water coolers conform to these requirements.

3.19.2 In lieu of the label or listing, with re-examination, the contractor may submit independent proof satisfactory to the contracting agency that his water dispensers conform to the published standards including methods of tests of the Underwriters' Laboratories, Inc., Standard UL-399 for water dispensers.

3.19.3 Compliance with the above preliminary requirements in regard to fire and casualty hazards does not absolve the contractor from complete compliance with the requirements of this specification in order to secure acceptance of his material.

3.19.4 Dispensers for use in explosive atmospheres. Where explosion-proof or dusttight dispensers are specified in the invitation to bid (see 6.2), such dispensers shall conform to the requirements of the Underwriters' Laboratories, Inc., for a specified group and class selected from Article 500 of the National Electrical Code A.S.A.C1. No belt-driven equipment will be acceptable for explosion-proof or dusttight water dispensers. Unless another group and class are specified in the invitation to bid (see 6.2) all explosion-proof dispensers shall conform to requirements for group 1, class D, a designation set up for atmospheres containing gasoline, petroleum, naphtha, alcohol, acetone, lacquer, solvent vapors, and natural gas. If dusttight dispensers are desired, the proper group and class shall be specified (see 6.2). Foot pedals when used, shall be of non-ferrous material (see 3.11).

3.19.5 Hot water pressure relief. When delivery of both hot and cold water is specified (see 6.2), the dispenser shall be equipped for positive pressure and temperature relief protection against damage to the hot water system in case of failure of the temperature controls.

3.20 Required capacity. Based on the operating conditions listed in table II, water dispensers, types I to VII inclusive, shall have minimum draw-off capacities shown in table III.

3.20.1 Type I, bubbler style. Type I dispensers shall have an air-cooled condenser, and shall have the equipment specified and shall be furnished in the sizes indicated in table III.

3.20.2 Type II, bubbler style. Type II dispensers shall have a water-cooled condenser, and shall have the equipment specified and shall be furnished in the sizes indicated in table III.

3.20.3 Type III, cafeteria style. Type III dispensers shall have an air-cooled condenser, and shall be for cafeteria service. Dispensers shall have the equipment specified and shall be furnished in the sizes and capacities indicated in table III.

3.20.4 Type IV, cafeteria style. Type IV dispensers shall have a water-cooled condenser, and shall be for cafeteria service. Dispensers shall have the equipment specified and shall be furnished in the sizes and capacities indicated in table III.

3.20.5 Type V, remote style. Type V dispensers shall have a water-cooled condenser, shall be equipped with an outlet for remote use and shall be furnished in the sizes and capacities indicated in table III.

3.20.6 Type VI, bottle style. Type VI dispensers shall have an air-cooled condenser and shall be for use with a 5-gallon inverted bottle. The bottle need not be furnished, but a suitable bumper ring for the bottle shall be furnished. This type of dispenser shall be furnished in the size indicated in table III.

3.20.7 Type VII, bubbler, style. Type VII dispenser and all equipment

furnished shall have the equipment specified and shall be furnished in the size and capacities indicated in table III based on the higher ambient temperatures and inlet water temperatures shown in table II for type VII dispensers.

3.21 Peak draw capacity. The quantity of water in gallons to be withdrawn from each of the different types of dispensers during the 15-minute peak draw period is shown in table III and 3.20 and the conditions of ambient temperature, inlet water temperature, and percentage spill through the pre-cooler (if used) are the same as those shown in table II for each type dispenser.

Table II. - Operating conditions

Operating conditions	Dispensers						
	I	II	III	IV	V	VI	VII
Ambient temperature, deg. F	90	90	90	90	90	90	100
Inlet water temperature, deg. F	80	80	80	80	80	90	100
Outlet drinking water temperature deg. F	50	50	50	50	50	50	50
Condenser water consumption gallons per gallon of drinking water, maximum	—	2.0	—	2.5	2.5	—	—
Spill through precooler, percent	60	60	—	—	—	—	60
Hot water outlet water temperature	165	165	—	—	—	165	—

Table III. - Capacity and equipment requirements

Size	Required draw-off capacity, cooled water, gallons per hour (minimum)	Peak draw capacity, gallons per 15-minutes period (minimum)	Equipment Required
			Types I and II dispensers
5	4.75	1.78	One bubbler.
5	4.75	1.78	One bubbler. One hot water cup filler, if specified.
10	9.5	3.56	One bubbler. One glass filler, if specified.
20	19.0	7.12	One bubbler. One glass filler, if specified.
			Types III and IV dispensers
20	19.0	12.3	Two glass fillers and one outlet for remote use.
30	28.5	18.5	Two glass fillers and one outlet for remote use. A third glass filler, if specified.
			Type V dispensers
10	9.5	4.75	Plain top unless otherwise specified. One outlet for remote use.
20	19.0	9.5	Plain top unless otherwise specified. One outlet for remote use.
30	28.5	14.3	Plain top unless otherwise specified. One outlet for remote use.
			Type VI dispensers
3.	2.85	1.07	One self-closing faucet.

3.	2.85	1.07	One self-closing faucet. One hot water cup filler, specified.
	9.5		Type VII dispensers
10	9.5	3.56	On bubbler. One glass filler, if specified.
20	19.0	7.12	One bubbler; two bubblers,if specified, and one glass filler, if specified.

3.21.1 Types I, II, VI and VII dispensers. Peak draw capacity of types I, II, VI and VII dispensers shall be such that when 37.5 percent of the required draw-off capacity in table III is drawn from the cooler during a 15 minute period, in accordance with the conditions of 4.5.5, the outlet drinking water temperature shall not exceed 60 degrees F. at any time during the 15-minute period.

3.21.2 Types III and IV dispensers. Peak draw capacity shall be such that when 65 percent of the required draw-off capacity per hour as shown in table III is drawn from the dispenser during a 15 minute period in accordance with the conditions of 4.5.5, the outlet drinking water temperature shall not exceed 55 degrees F. at any time during the 15-minute period.

3.21.3 Type V dispenser. Peak draw capacity of type V dispenser shall be such that when 50 percent of the required draw-off capacity in table III is drawn from the dispenser during a 15 minute period in accordance with the conditions of 4.5.5, the outlet drinking-water temperature shall not exceed 55 degrees F. at the outlet for remote connection on the dispenser at any time during the 15-minute period.

3.2.2 Maximum operating conditions. The water dispensers shall start and operate under conditions of 110 degrees F. ambient temperature, 100 degrees F. inlet drinking-water temperature, and 50 degrees F. outlet water temperature with 100 degrees F. inlet condensing-water temperature for water-cooled-condenser types, except that types VI and VII dispensers shall operate with 100 degrees F. inlet drinking water temperature. Sixty percent of the drinking water shall spill through the precooler (if used) for types I, II and VII. Under the above operating conditions the consumption of condensing water shall not exceed 2.5 gallons per gallon of drinking water cooled for type II dispensers and shall not exceed 3.0 gallons per gallon of drinking water cooled for types IV and V dispensers for the range of water-supply-line pressures from 20 to 75 p.s.i.g. The difference between the condenser inlet water temperature and the temperature of the refrigerant leaving the condenser shall not exceed 30 degrees F. under these same operating conditions (for test procedures see 4.5.3).

3.23 Performance under overload conditions. Each type dispenser shall start and operate continuously in an ambient temperature of 104 degrees F. (40 degrees C.) with inlet water at a temperature of 90 degrees F., except for type VI dispenser, and with water drawn at a rate of 300 percent of the required capacity listed in table III and 60 percent spill through the precooler (if used) for types I, II, and VII. The inlet water temperature shall be 104 degrees F. for type VI dispensers. The dispensers shall not exceed the maximum values specified in CC-M-636 for fractional-horsepower alternating-current motors or in CC-M-641 for integral-horsepower alternating-current motors. The temperature-rise limits for totally enclosed motors in the above specifications, shall be sued for hermetic compressor motors (for test procedures see 4.5.4).

3.24 Automatic temperature control.

3.24.1 Chilled drinking water. For types I, II, VI and VII dispensers, the automatic temperature control shall provide drinking water at temperatures no lower than 40 degrees F. and no higher than 50 degrees F. for one position of the thermostat adjusting device and shall provide drinking water at temperature no lower than 50 degrees F. and no higher than 60 degrees F. for another position of the thermostat adjusting device for rates of water withdrawal of no-load and one-half the appropriate required hourly capacity listed in table III when the dispensers are operated in accordance with the conditions of 4.5.6. For types III, IV, and V dispensers, the automatic temperature control shall provide drinking water at temperature no lower than 38 degrees F. and

no higher than 44 degrees F. for some one position of the thermostat adjusting device and shall provide drinking water at temperatures no lower than 44 degrees F. and no higher than 50 degrees F. for another position of the thermostat adjusting device for rates of water withdrawal of no-load and one-half the appropriate required hourly capacity listed in table III when the dispensers are operated in accordance with the conditions of 4.5.6. Drinking water at a temperature lower than 37 degrees F. shall be discharged from any type dispenser with any position of the thermostat adjusting device for rates of water withdrawal of no-load and one-half required hourly capacity as listed for the appropriate type dispenser in table III.

3.24.2 Hot water. The automatic temperature control shall provide hot water at a temperature no lower than 165 degrees F. and no higher than 195 degrees F. at one setting of the temperature control at a draw-off rate of forty-five 6 ounce cups per hour with an inlet water temperature of 80 degrees F.

3.25 Motor-overload protective device. The compressor-motor-overload protective device may be of either the hand-reset or automatic-reset style. It shall open the electric circuit to the motor before the running winding of the motor reaches a temperature of 302 degrees F. in case of failure of the starting mechanism of in case of excessive overload caused by interruption of the supply of cooling air or cooling water for the condenser when the dispenser is operated in accordance with the conditions described in 4.5.7. Fan motor windings shall not exceed a temperature of 302 degrees F, under condition of locked rotor in accordance with test procedures of 4.5.7.

3.26 Water regulators, bubblers, and glass fillers.

3.26.1 For types I, II and VII dispensers, the water-regulating devices as specified in 3.10.2, shall control the flow of drinking water at a water-dispenser supply-line pressure of 35 p.s.i.g., with all bubblers open, at a minimum rate of 1/2 gallon per minute per bubbler, and, with all glass fillers open, at a minimum rate of 3/4 gallon per minute per glass filler. The crest of the jet of water from bubblers shall be at least 1 inch above and 2 inches away from any part of the bubbler assembly. For a range of water supply line pressures from 20 to 75 p.s.i.g., unless otherwise specified in the invitation to bid, (see 6.2), the water regulating device(s) shall not permit the flow rate through bubblers to deviate by more than 15 percent from the flow rate at a supply-line pressure of 35 p.s.i.g., and shall not permit the flow rate through glass fillers to deviate by more than 50 percent from the flow rate at a supply line pressure of 35 p.s.i.g. The jet of water shall issue from the bubbler nozzle at an angle that prevents return of water into the orifice or orifices from which it issues; the jet shall not touch the guard or splash on the floor; and the stream of water shall not spurt when the valve is opened. The stop valve for each fixture shall not leak under the conditions of the hydrostatic test in 4.5.9.2).

3.26.2 Cafeteria and remote style dispensers. On types III and IV dispensers, the automatic water regulator shall control the flow of water with a water-dispenser supply-line pressure of 35 p.s.i.g. with all glass fillers open so that a minimum flow rate of 1-1/2 gallons per minute shall be delivered from each glass filler. For type V dispensers, the automatic water regulator shall control the flow of drinking water at a minimum rate of 1-1/2 gallons per minute for size 10, 3 gallons per minute for size 20 and 4-1/2 gallons per minute for size 30 for a water-dispenser supply-line pressure of 35 p.s.i.g. On types III, IV, and V dispensers, for a range of water-supply pressures from 20 to 75 p.s.i.g., unless otherwise specified (see 6.2), the automatic water regulator shall not permit the flow rate to deviate by more than 15 percent from the flow rate at a supply-line pressure of 35 p.s.i.g. The jet of water shall not spurt from the glass filler when the valve is opened. The stop valve for each fixture shall not leak under the conditions of the hydrostatic test specified in 4.5.9.2.

3.26.3 Bottle style dispensers. For type VI dispensers, the minimum flow rate shall be one fourth gallon per minute.

4. SAMPLING, INSPECTION AND TEST PROCEDURES

4.1 Suppliers' responsibilities for inspection. The supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and services acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order (see 6.2). 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.

4.2 Preproduction inspection. Inspection and testing of the preproduction sample shall be made of a completely assembled end item for all the provisions of this specification applicable to end product examination and tests. Tests on the preproduction sample shall be made by the supplier, and at the option of the Government. Any or all of these tests will be witnessed by an authorized Government representative. Tests for requirements of 3.5.1 and 3.20 through 3.27 shall be performed on the preproduction sample only. However, these tests may be repeated at the option of the Government when there is a change in design, construction, material or other departure subsequent to approval of the preproduction sample. Preproduction sample testing may be waived, providing that the contracting officer finds that the model offered or presented by the supplier is equal or superior in quality and capable of performing all of the functions in accordance with the specification requirements as determined by visual examination of the unit presented, and comparison of component parts of the unit presented with either the component parts, bills of materials, or drawings of the unit previously found acceptable on a Government contract for

which certified test data is being furnished and the evaluation of satisfactory test data previously obtained on a Government contract, and provided that the supplier furnishes satisfactory copies of certified test data covering these previous tests to the Government inspector. This test data must indicate compliance with all specified test conditions and must have been obtained as a result of tests conducted within the past four years on an identical type, size and class dispensers furnished on a Government contract. In addition to test data, a certified statement will be required to the effect that dispensers being furnished are identical to those previously tested.

4.3 General inspection.

4.3.1 Inspection for acceptance. Inspection shall be made in accordance with the provisions set forth in MIL-STD-105 except where otherwise indicated hereinafter. The inspection terms and definitions shall be interpreted in accordance with MIL-STD-109.

4.3.1.1 Inspection of materials and components. In accordance with 4.1, the supplier is responsible for insuring that components and materials used were manufactured, tested and inspected in accordance with the specified requirements of referenced subsidiary specifications and standards to the extent specified herein, or, if none, in accordance with this specification.

4.3.1.2 Intermediate visual and dimensional examination. The intermediate product or assemblies which cannot be checked or measured after final assembly shall be examined at various stages of manufacture for compliance with this specification. Examination will be made at an appropriate intermediate station for defects in construction, workmanship, dimensions and material. Any deviation from specified requirements shall be classified a defect. The inspection level shall be S-1 with an acceptance quality level of 4.0 defects per hundred units.

4.3.1.3 Examination of the end product. The defects found during examination shall be classified in accordance with 4.3.1.3.1 and 4.3.1.3.2. The sample unit for these examinations shall be one completely fabricated dispenser.

4.3.1.3.1 Visual examination. Examination for defects in finish, construction, material, design, workmanship and marking.

EXAMINE	DEFECTS	MAJOR	MINOR
Finish	Not finished, plated or coated (where required)	X	
	Type or color of finish not as specified, or blistered, peeled, chipped or area of no film or thin film.		X
	Poor touch up, color separation, stained, over-spray, runs, sags, foreign matter embedded in finish or finish otherwise impaired.		X
Material	Any component not fabricated of the specified material.	X	
Construction & Workmanship	Any part missing, or not specified type or size.	X	
General (applicable to all components	Broken, deformed, dented, bent, deteriorated or otherwise seriously impaired.	X	

& assemblies)			
	Dented, bent, or otherwise damaged, not affecting serviceability.		X
	Misplaced, loose or out of alignment.		X
	Any functioning component that is inoperative or will not operate as intended.	X	
	Any functioning component that requires abnormal force to operate		X

EXAMINE	DEFECTS	MAJOR	MINOR
Construction & Workmanship General (applicable to all components & assemblies) (cont'd)	Refrigerant tubing outside cooling unit housing which operates below 75 degrees F. not fully insulated to prevent condensation.		X
	Water piping or tubing not rigidly mounted in cabinet to prevent strain when making outside connections.	X	
	Insulation on cold (below 75 degrees F) refrigerant tubing not vapor resistant type or treated to provide vapor seal.	X	
Welding	Missing, incomplete, burn holes, cracked, fractured, severe undercut or otherwise not fused.	X	
	Slag inclusion, gas pocket, slight undercut, not smooth and uniform, scale or flux deposit not removed.		X
Castings	Not complete (miscast) or blowholes impairing use.	X	
	Pitted, small blowhole, etc., not impairing use.	X	
	Not cleaned, i.e., flash, fins, sharp edges, etc., not removed.		X
Bolts, nuts, screws, studs, and other types of threaded fasteners.	Missing, not type specified, broken, stripped or fractured.	X	
	Otherwise defective, not impairing use.		X
Water dispenser assembly	Not rigid.	X	
	Component not fabricated of material specified.	X	
	Not fully assembled (except glass filler foot pedals, automatic regulators for type V dispensers external vacuum breaks which may be packed disconnected in water dispenser container).	X	
	Component not finished as specified.		X
	Dispenser not ready for connection and operation.	X	
	Legs uneven by more than 1/16 inch.		X
	Openings around removable sections more than 3.23 inch.		X
	Dirt or foreign material inside compartment.		X

EXAMINE	DEFECTS	MAJOR	MINOR
Cabinet	Not steel construction		X
	Not ventilated		X
	Types I, II, V, VI and VII, do not have steel base or steel legs.	X	
	Legs or base do not have a corrosion resisting finish.		X
	Adjustable legs not furnished for type III and type IV dispensers.	X	
	Legs for type III and IV dispensers corrosion resistant polished steel.	X	
	Legs for types III and IV dispensers enough to provide 6 inches of clearance between floor and cabinet.	X	
Top	Types I, II and VI dispensers not furnished with basin type tops.	X	
	Types III and IV dispensers with top mounted glass fillers not furnished with basin type tops.	X	
	Not equipped with bubbler and/or glass filler as specified (check contract).	X	
	Openings in strainer for drain more than 1/4 inch in diameter.		X
	Strainer not same materials as top, or corrosion-resisting steel or chromium plated metal.	X	
	Corners not rounded.		X
	Not fabricated of material specified for type of dispensers in contract (see par. 3.5.1).	X	
	Top does not fit snugly and conform to the cabinet.		X
Drain tray	Not readily accessible for cleaning for types III and IV dispensers equipped with front or side mounted glass fillers and type VI dispensers.		X
	Not metal with corrosion-resistant finish other than organic finish, for types III and IV dispensers.	X	
	Type VI dispensers not equipped with a removable 1-quart corrosion-resistant receptacle.	X	
Bubbler	Not furnished per specification table III (check contract) (Par. 3.20).	X	

EXAMINE	DEFECTS	MAJOR	MINOR
Bubbler (cont'd)	Nozzle orifice and other openings in the supply to the nozzle not 3/4 inch above the rim of the bowl.		X
	Guard not fabricated of nonferrous metal, chromium plated or of corrosion resisting steel.	X	
Glass Fillers	Not fabricated of brass, chromium plated, or of corrosion-resisting steel.	X	
	Not furnished as specified for types I, II, III, IV and VII.	X	
	For types I, II, and VII dispensers not designed for filling either a vessel 6 inches in diameter and 9 inches high or an 8 ounce glass.		
	For types III and IV dispensers not designed for filling either a vessel 6 inches in diameter and 11 inches high or an 8 ounce glass.	X	
	For type VI not designed for filling paper cups or glasses.	X	
	Not designed or located in such a manner that spilled water falls into the basin top or drain tray as required.	X	
Drinking-Water Flow Controls	Stop valve and/or flow regulator not accessible for adjustment or replacement without cutting or breaking the insulation vapor seal or removal of parts of the dispenser other than cover plates or detachable cabinet sections.	X	
	Drinking water flow regulator not furnished for bubblers and/or glass fillers.	X	
	Drinking water regulator not automatic for bubblers on types I, II and VII dispensers (may be either automatic or non-automatic for glass fillers).		
	Drinking water flow regulator not automatic for bubblers and glass fillers on types III, IV and V dispensers.	X	
	Not fabricated of brass, bronze or corrosion-resistant steel throughout.	X	
Cooling Unit (Chilled Water Storage Chambers	Outlet not provided at bottom of water storage chamber to provide means of draining and flushing chamber (It shall not be directly connected to any waste line within the cabinet of dispenser.	X	
	Materials for chambers and water tub connections are not as specified (see 3.12).	X	

EXAMINE	DEFECTS	MAJOR	MINOR
Condensing Unit	Not specified type, i.e., water cooled or air cooled, etc.	X	
	The shaft seal on System O Compressor not fitted with a replaceable seal shoulder and ring.	X	
Condensers (Air Cooled)	Not fabricated of specified material.		X
	Not protected after fabrication to resist corrosion.		X
	Fins, wires or other radiating surfaces not secured for permanent contact with the tubing.		X
Condensers (Water Cooled)	Not constructed of brass or copper tubes.	X	
	Not provided with an automatic water-regulating valve (see 3.13.3.)		X
Refrigeration and hot water controls	Temperature of drinking water not controlled automatically.	X	
	Thermostat not adjustable by means of a knob, lever, screw, or other simple device external to the case of the thermostat.		X
	Thermostat and adjusting device not enclosed within the dispenser cabinet.	X	
	Thermostat and controlling device not accessible for adjustment or replacement by detaching a removable section of the cabinet.	X	
Motor	Not specified voltage and current characteristics.	X	
	Lubrication fittings are of the pressure type.	X	
Electrical wiring	Not specified type, cut, abraded, excessive insulation stripped from wire, not properly joined.	X	
	Dispensers other than explosion-proof, dust-tight or permanently wired types, not equipped with a cord (National Electrical Code Type SJ, SJO, SJT, SPT or equivalent.	X	
	Cord not equipped with attachment plug.	X	
	Cord extends less than 5 feet or more than 9 feet beyond the cabinet.		X
	Cord not protected to prevent abrasion at the entrance to the cabinet.		X
	Cord not provided with strain relief at or near the terminals in the dispenser.		X

EXAMINE	DEFECTS	MAJOR	MINOR
Water piping	Connections not provided with female pipe fittings with specified threads.	X	
	Piping, tubing, or fittings not of specified size or materials.	X	
	Connections project more than 1/2 inch beyond the cabinet.		X
	Connections not accessible with disassembling or removing any portion of unit, other than removable panels.		X
	Drinking water waste drain fittings less than 1-1/4 inch.	X	
	Piping, tubing or fittings not rigidly secured to prevent damaging strain on internal pipe or tubing when external connections are made.	X	
Refrigerant piping and accessories.	Not securely supported.		X
	Refrigerant piping and supports not insulated where required (see 3.16.2).		X
	Not of specified materials.	X	
Marking, name plate, component parts data, warning plates, instructions for care and operation.	Missing, incomplete, illegible. Does not indicate type of size. Not in proper location. Not affixed in the prescribed manner. Plate, label, tag, not fabricated of the specified material, not stenciled, stamped, indented, embossed, printed, lithographed, etc., whichever is required.		X

4.3.1.3.2 Dimensional inspection. Any dimension not within the specified requirements shall be classified as a defect.

4.3.1.3.3 Inspections levels and acceptable quality levels. Inspection levels and acceptable quality levels (AQL's), expressed in defects per 100 units, shall be as follows:

		AQL	
	Inspection Level	Major	Total
Defects applicable to 4.3.1.3.1	II	2.5	6.5
Defects applicable to 4.3.1.3.2	S-2	-	6.5

4.4 Acceptance testing.

4.4.1 Intermediate testing. Intermediate testing shall be performed by the supplier in accordance with the requirements of table VI.

4.4.2 Testing of the end product. Each dispenser shall be tested by the

contractor in accordance with par. 4.5.9.2. In addition, each complete dispenser shall be operated by the contractor for a period of one hour during which time it shall be examined to determine that it refrigerates properly does not leak water, drains adequately, and water flows uniformly when subjected to a water supply pressure from 25 to 75 p.s.i.g. During this test, controls, valves and other working parts of the unit shall be examined to determine that proper operation is obtained and that no excessive noise or vibration is present. Design tests outlined in paragraphs 4.5.2 through 4.5.8 and shall be conducted as specified in paragraph 4.2.

4.5 Performance tests. The following test procedures shall be used to determine compliance with performance requirements in 3.21 through 3.27. In all tests requiring operation of the dispenser, the sample dispenser, with all panels in place, shall be located in a temperature-controlled space wherein the temperature of the dispenser shall not be affected by direct radiation to or from external equipment, and no abnormal air flow shall be introduced over the dispenser, condenser or condensing unit. Measurement of inlet or outlet water temperature shall be made at points close to the respective connections to the dispenser. Voltage measured at the service connection shall be held at the value specified in the invitation to bid, contract or order. Tolerance on temperature measurements and control shall be plus or minus 1.0 degree F. and on pressure measurements and control shall be plus or minus 2 p.s.i.g. and on supply voltage plus or minus 2 volts.

4.5.1 Freezing test. The freezing test shall be conducted prior to other performance tests. Water dispensers equipped with a device intended to prevent formation of ice in the water-cooling unit, shall be operated with all controls functioning except the primary drinking-water hemostat, which shall be shunted, in an ambient temperature of 40 degrees F. plus or minus 1 degree F. for a minimum of 16 hours. If drinking water can be drawn from all the bubblers or glass fillers after 16 hours operation, the water dispenser shall have passed the freezing test. If drinking water cannot be obtained from any one bubbler or glass filler after the first 16-hour period of operation, the water dispenser shall be thawed out, and then operated for five additional 16-hour periods in an ambient temperature of 40 degrees F. plus or minus 1 degree F. with a thawing-out after each period. At the end of the last thawing, except for type VI dispensers, the water-containing parts shall be tested for leaks at a pressure of 125 p.s.i.g. Type VI dispensers shall not leak when operating normally with a full water bottle in place. Water dispensers that permit freezing but are equipped to relieve the pressure caused by freezing to other than the external water-supply line to the dispenser shall be operated with the primary thermostat shunted in an ambient temperature of 40 degrees F. plus or minus 1 degree F. for six successive 16-hour periods with a thawing-out between periods. At the end of the sixth thawing out, the water-containing parts shall be inspected for damage and tested for leaks at a pressure of 125 p.s.i.g. Relief to the water-supply line to the dispenser shall be blocked by means of a nonleaking valve during the freezing tests.

4.5.2 Capacity test. The capacity test shall be conducted following the freezing test. Each sample dispenser shall be operated with the compressor running continuously under appropriate conditions listed in table II and 3.20 until steady state conditions are attained after which observations shall be taken at 20-minute intervals, until six successive observations at steady state conditions have been obtained. Supply water pressure at the inlet to the dispenser shall be 35 p.s.i.g. for types II, IV, and V dispensers. During the test period, observations shall be made of temperature of ambient air, inlet water, outlet drinking water; and flow rate of outlet drinking water, outlet condensing water and of spilled water through the precooler; and the voltage at the service connection. Drinking water shall be spilled water through the precooler; and the voltage at the service connection. Drinking water shall be drawn steadily at a rate which results in delivery at a temperature of 50 degrees F. Type VI coolers shall be tested with water-filled 5-gallon bottles or suitable constant-level water-feed arrangement. The observed hourly capacity, corrected for a 30-degree temperature difference (40 degrees for type VI and 50 degrees for type VII), must equal or exceed the appropriate requirement listed in table III.

4.5.3 Maximum operating test. Each sample dispenser shall be operated for at least 8 hours in conformance with the conditions listed in 3.22 and with outlet drinking water drawn steadily at a rate which results in delivery at a temperature of 50 degrees F. The test shall be conducted in two periods and

each period shall be continued until steady state conditions have been observed for 4 hours with continuous compressor operation. At the end of each 4-hour test period, and without adjusting any conditions, the electric power to the dispenser shall be turned off at least twice for a period of 5 minutes each. The electricity shall be turned on again at the end of each off-period, and the compressor shall start and operate satisfactorily for at least 5 minutes without tripping the compressor-motor-overload device. For dispensers with air-cooled condensers, the entire test shall be conducted with a supply water-pressure at the dispenser of 35 p.s.i.g. For dispensers with water-cooled condensers, the supply water pressure for the first 4-hour test period shall be 75 p.s.i., for the second 4-hour test period it shall be 20 p.s.i.g. During the test periods observations of temperature of ambient air, inlet water, outlet drinking water, and refrigerant leaving water-cooled condensers; flow rate of outlet drinking water, flow rate of spilled water through the precooler, flow rate of condenser water, and voltage at the service connection shall be made at minute intervals. For water-cooled unit the quantity of condenser water used per gallon of drinking water cooled, after

the quantity of such drinking water has been corrected to a 50-degree temperature difference, shall not exceed the appropriate quantity listed in 3.22, for either of the two 4 hour test periods, and the temperature difference between the inlet water and the refrigerant leaving the condenser, shall not exceed 30 degrees F.

4.5.4 Overload test. Each sample dispenser shall be operated continuously at the conditions specified in 3.23 until steady state has been observed for 4 hours. Supply-water pressure at the dispensers having water-cooled condensers shall be 35 p.s.i.g. During the 4-hour test period, observations shall be made at 20-minute intervals of ambient temperature, inlet water temperature, drinking water flow rate, rate of spilled-water flow through precooler, and the voltage at the service connections. The dispenser shall operate without tripping the compressor-motor-overload device and without breakdown. The temperature rise of the compressor-motor windings and the fan motors shall be determined at the end of the 4-hour test period. The temperature rise of copper running windings in compressor and condenser fan motors shall be measured by the resistance method and the temperature rise computed by means of the following formula:

Temperature rise degrees F. =

$$(390 + t_c) \frac{R_h}{R_c} - (390 + t_a)$$

where R_c = cold resistance of winding

R_h = hot resistance of winding.

t_c = temperature deg. F. of winding when cold resistance was measured.

t_a = ambient temperature deg. F. surrounding cooler during test.

The temperature rise of all motors shall not exceed the appropriate values in table IV motors shall be considered as totally enclosed motors.

Table IV - Maximum permissible temperature rise of running windings of electric motors with class A insulation during overload test [1]

Open-type motors	Protected-type motors	Totally enclosed and hermetic motors	Condenser fan motors
Fractional-horsepower sizes			
90 deg. F	90 deg. F	146 deg. F	146 deg. F
Integral-horsepower sizes			
90 deg. F	108 deg. F	146 deg. F	———

[1] Temperature rise to be measured by the resistance method.

4.5.5 Peak draw test. Each sample dispenser shall be tested for peak draw capacity in accordance with conditions of ambient temperature, inlet water temperature and percent spill through the precooler shown in table II and with the quantity of water shown as peak draw capacity in table III withdrawn in

15 minutes. Preparatory to making the peak draw test, a steady flow of drinking water equal to one-half the required hourly drawoff capacity shall be established, all of which shall be discharged into the basin or drain tray and the thermostat shall be adjusted to stop the compressor motor for at least three consecutive cycles at an outlet drinking-water temperature of 45 degrees

F. plus or minus 1 degree F. If a cut-off temperature as low s 46 degrees F. cannot be obtained, the peak draw test shall be made at the lowest setting of the thermostat. If a cut-off temperature as high as 44 degree F, cannot be obtained by means of the single external thermostat adjustment, the cooler shall have failed the peak draw test. After obtaining the thermostat setting the dispenser shall be permitted to cycle at least three times with the above steady drinking-water flow. The steady drinking-water flow shall then be turned off while the compressor is running and the peak draw test shall be started immediately following the next thermostat cut-off. The water shall be withdrawn in the appropriate number of samples and at the appropriate rate as shown in table V.

Table V. - Minimum flow rate during peak draw test, g.p.m.

Size of dispenser	Number of draws	Minimum flow rate during peak draw test, g.p.m. (Multiply by number of fixtures on dispenser as specified)			Total flow g.p.m.
		Type VI	Types I, II, III	Types III IV	Type V
3	15 or 30———	1/4	———	———	———
5	15 or 30———	———	1/2	———	———
10	30 or 60———	———	1/2		1-1/2
20	30 or 60———	———	1/2	1-1/2	3
30	30 or 60———	———	———	1-1/2	4-1/2

Observations to be made during the test shall include ambient temperature, inlet water temperature and outlet water temperature. The outlet water temperature of each sample drawn shall be measured at least once and all such measurements shall be made in an identical manner. The test shall be conducted in such a manner that effective use of the precooler, (if used) is made for types I, II and VII dispensers. Dispensers comply with peak drawn requirements if outlet water temperatures observed do not exceed the appropriate values listed in 3.21.

4.5.6 Automatic temperature control. Each sample dispenser shall be operated in accordance with the conditions of ambient temperatures and inlet water temperature shown in table II and 3.20 and the automatic temperature control shall meet the requirements of 3.24 when tested at no-loan condition and at 1/2 required hourly draw-off capacity. The water supply pressure to types III, IV and V dispensers shall be maintained at 35 p.s.i.g. during the thermostat tests. Immediately before starting each thermostat test, the compressor shall be operated until two thermostat cycles occur, or until steady water temperatures are observed while water is being withdrawn at the rate for that particular test. Samples of drinking water shall be withdrawn for temperature measurement at regular time intervals at the following minimum flow rates:

			g.p.m.
Dispenser.....	types:	I, II and VII———	1/2
Dispenser.....	types:	III, IV———	1-1/2
Dispenser.....	types:		
Dispenser.....	V size	10———	1-1/2
Dispenser.....	V size	20———	3
Dispenser.....	V size	30———	4-1/2
	type:	VI———	1/4

The no-load test shall consist of withdrawal of one-tenth the appropriate hourly capacity shown in table III each hour for a three-hour test period. The half-load test shall consist of withdrawal of one-half the appropriate hourly capacity shown in table III each hour for at least two hours or until at least five complete thermostat cycles have occurred, whichever is longer. For both the no-load and half-load test sufficient 10-12 fl. oz. samples for sizes 3.5 and 10 dispensers and 30-35 oz. samples for sizes 20 and 30, shall be withdrawn at equal time intervals. Each sample of water withdrawn during the no-load test or the half-load test shall consist of two equal portions, the first portion of which shall be discarded promptly into the basin or drain tray. The temperature of the second portion shall be measured. The second portion, for types I, II and VII dispensers shall be discharged into the basin in a manner to make effective use of the precooler (if used). The average temperature of

the second portion of each sample of water withdrawn shall be carefully measured with an accurate thermometer or thermocouple and the temperature recorded. The minimum temperature of the second portion of all samples drawn shall not be lower than 37 degrees F. for the lowest position of the thermostat range adjustment. The minimum and maximum temperatures of the second portio of all samples drawn during tests at other thermostat settings shall be used for determining compliance of the automatic temperature control with the requirements of 3.24.

4.5.7 Motor overload protective device test. Each sample dispenser shall be tested under conditions of specified voltage, 90 degrees F. ambient temperature, and 80 degrees F. inlet water temperature (90 degrees F. for type VI dispensers) and with a steady drinking-water flow rate equal to 300 percent of the appropriate required hourly capacity, all of which shall be discharged to the basin or drain tray. The following three tests shall be made:

4.5.7.1 Operation with blocked condensing medium. For this test the air flow through air-cooled condensers and the water flow through water-cooled condensers shall be blocked and the unit operated for at least two hours or until four successive measurements of compressor running-winding temperature, at time of over-load trip-out or of high-pressure switch tripout, indicate temperature equilibrium. If no trip-outs occur, the temperature of the compressor running winding shall be measured at the end of the two-hour test period. Fan motors, if separate from compressor motors shall be disconnected for this test.

4.5.7.2 Failure of starting mechanism. The starting winding of all single-phase compressor motors and one power lead to all three-phase compressor motors, shall be disconnected and specified voltage applied to the service connection of the dispenser. The test shall be continued for two hours or until four successive measurements of compressor-motor running-winding temperatures at time of over-load trip-out indicate temperature equilibrium. (Note. For three-phase motors, the temperature observations shall be made of the energized winding.)

4.5.7.3 Locked-rotor test of fan motors. Fan motors shall be energized with the rotor locked for a period of two hours or until four successive readings indicate that the temperature of motor windings has reached a steady state. The resistance of the fan-motor windings shall be measured each time the overload protective device functions, or at 15-minute intervals if the motor is not equipped with an overload protective device.

4.5.7.4 Temperature of motor windings. The temperature of the compressor and fan motor windings when the overload protective device disconnects the windings from the circuit shall be determined by the following formula for copper conductors:

$$t_{[h]} = (390 \text{ [not similar] } t_{[c]}) \frac{R_{[h]}}{R_{[c]}} - 390$$

where $t_{[h]}$ is the temperature of the motor windings when disconnected from the circuit by the overload device, deg.F.

$t_{[c]}$ is the temperature of the motor windings when the motor is cold and in equilibrium with the ambient temperature, deg. F.

$R_{[h]}$ is the resistance of the motor windings hot.

$R_{[c]}$ is the resistance of the motor windings at temperature $t_{[c]}$.

The temperature of the compressor and fan motor windings shall not exceed 302 degrees F. based on the average of the four highest observations taken.

4.5.8 Jet of water and water regulator. The rate of water flow from all fixtures (from remote outlet on type V) on each sample dispenser of types I, II, III, IV, V and VII, shall be measured at water-supply-line pressures of 20, 35, and 75 p.s.i.g., when all fixtures are open, to determine compliance with applicable requirements of 3.26. The characteristics of the jet of water for all dispensers except type V, shall be measured and observed to determine compliance with applicable requirements of 3.26. The flow rate from type VI dispensers shall be measured with water drawn from a water filled 5-gallon bottle in place.

4.5.9 Pressure test.

Table VI. - Instructions for Testing

Characteristic	Requirements	Basic Spec. Req. Para.	Test Method	Rqt. Appl. To Indiv Unit	Rqt. Appl. To Lot Avg.	No. of Defects Per Sample Unit	Results Reports to Nearest	Inspection Level	AQL
Pressure Test *	shall not suffer damage when tested in accordance with 4.5.9.2	3.2.4	4.5.9	X		1	pass or fail	*	*
Moisture content of refrigerating system	shall not exceed 35 P.P.M.	3.3	4.5.10	X		1	pass or fail	S-2	6.5

* Test shall be performed not less than once per contract on each type, size, refrigerating system and power supply, (either on the preproduction sample, or an initial production unit). Changes in design, material, construction, or other departure which may affect the initial test results, shall be cause for retesting.

4.5.9.1 Refrigerant working pressure. The refrigerant-containing system of each dispenser to be furnished on the contract shall not be damaged or leak when tested at the pressure listed in table VII for the refrigerant used.

Table VII - Working test pressure

Refrigerant	Test pressure, minimum	
	High pressure side	Low pressure side
No. 12 Dichlorodifluoromethane, CCl_2F_2	p.s.i.g. 235	p.s.i.g. 140
No. 22 Monochlorodifluoromethane, $CHClhF_2$	385	235

4.5.9.2 Water-circuit pressure test. Except for type VI dispenser, the water-containing circuit on each dispenser to be furnished on the contract shall not be damaged or leak when tested from the inlet to the stop valve at a pressure of 125 p.s.i.g. Except for type VI dispenser, the portion of the circuit from the stop valve to the outlet shall not be damaged or leak when tested at a pressure of 30 p.s.i.g. Type VI dispensers shall not leak when operating normally with a water-filled bottle in place.

4.5.9.3 Except for dispensers with water-cooled condensers not equipped with

a high-pressure cutout, the entire refrigerant-containing system shall be subjected to, and withstand without damage, a gas or hydrostatic test of 150 percent of the working pressures listed in table VI for the appropriate refrigerant. The low-pressure side of the refrigerating system on water-cooled units not equipped with a high-pressure cutout shall be subjected to and withstand without damage, a gas or hydrostatic test of 150 percent of the low-side working pressures listed in table VI for the appropriate refrigerant. The high-pressure side of the refrigerating system on such dispensers shall be subjected to, and withstand without damage, a gas or hydrostatic test of 150 percent of the maximum pressure developed under the following conditions: The dispenser shall be operated for not less than 1 hour in a 90 degrees F. ambient temperature with water withdrawal at 300 percent of appropriate hourly draw-off capacity listed in table III, with 100 percent spill through the precooler (if used) with an inlet water temperature of 80 degrees F. and with the condenser water flow blocked.

4.5.10 Moisture content of refrigerating system. After at least 1 hour of continuous operation of the motor-compressure unit in an ambient temperature of 70 degrees F. or higher with drinking-water at an inlet temperature of 70 degrees F. or higher flowing at a rate of 300 percent of the required hourly capacity, the water dispenser specimen shall be disconnected from the electrical supply and allowed to stand for 1 hour with the water flow continued. A sample of refrigerant vapor shall then be withdrawn from the low-pressure side of the system and its moisture content determined by either the gravimetric method employing P_2O_5 or the electrical method employing hygroscopic film for compliance with the requirements of 3.3

4.5.11 Radio-interference test. When required (see 3.14.5) test for radio-interference suppression shall be conducted on electric motors in accordance with MIL-I-16910, and all testing equipment, instruments, personnel for making the tests, the test location, which shall be reasonably free from radiated and conducted interference, and other necessary facilities shall be furnished by the contractor. Tests for radio-interference suppression will not be required for electric motors that are physically and electrically identical to those that have met requirements of MIL-I-16910.

4.6 Code and Standard Compliance. The supplier shall furnish the Government Inspector with proof of compliance with the requirements of the American Society for Testing Materials, the National Board of Fire Underwriters, and Underwriters' Laboratories, Inc., as applicable to paragraphs 3.12.3.1, 3.14.4 and 3.19. The contractor shall also furnish proof that specification referenced motors (see 3.14.1) comply with requirements of CC-M-636 and/or CC-M-641, as applicable.

4.7 Examination of preparation for delivery. An examination will be made to determine that preservation, packaging, packing and marking as required by Section 5, of this specification, are complied with. Defects will be scored as specified below. The inspection level shall be S-4 with an acceptable quality level of 6.5 defects per 100 units.

EXAMINATION	DEFECT
Markings Exterior and Interior	Omitted; incorrect, illegible; of improper size, location, sequence or method of application.
Materials	Component missing, damaged, or otherwise defective affecting serviceability.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling: bulging or distortion of container, blocking and cushioning inadequate, improper or missing.

NOTE: In the event the dispenser construction incorporates a condenser waste line emerging from the cooler separately from the drinking-water waste drain, the external vacuum-break-assembly described in 3.16.1.3 shall be furnished.

5. PREPARATION FOR DELIVERY

(For civil agency procurement the definitions and application of levels of preservation, packaging and packing shall be in accordance with Fed. Std. No. 102.)

5.1 Preservation and packaging. Preservation and packaging shall be level A, B, or C, as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Disassembly. Detachable fixtures, valves and piping that protrude from the exterior surface of the dispenser shall be removed. The detached components shall be wrapped in cushioning material conforming to PPP-C-843 and packaged in a box conforming to PPP-B-636, class 1, RSC. The box shall be closed in accordance with the appendix to the box specification and shall then be secured in a fixed position within the cabinet.

5.1.1.2 Openings. All openings to the electric motors, switches, water

piping and drains shall be sealed with tape conforming to PPP-T-60, type III, class 1.

5.1.1.3 Technical publications. Technical publications shall be preserved in accordance with MIL-P-116, method 101. The preserved publications shall be secured in a fixed position within the cabinet.

5.1.2 Level B. Each dispenser shall be packaged as specified in 5.1.1 except that sealing of openings to the electric motor, water piping and drains and waterproof packaging of technical publications shall not be required.

5.1.3 Level C. Each dispenser shall be preserved and packaged in accordance with the suppliers' commercial practice.

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

5.2.1 Level A. Each dispenser shall be packed in a box conforming to PPP-B-601, overseas type, style optional, or to PPP-B-621, class 2, style optional, or to PPP-B-640, class 2, grade A, as specified (see 6.2). The dispenser shall be covered with a close-fitting shroud extending to the bottom edges of the unit. The material for the shroud shall conform to UU-P-271, as specified for interior wraps or shrouds. After covering with the shroud the dispenser shall be cushioned and held securely within the container by placing edge pads over the full length of all edges of the dispenser. The edge pads shall be built up of double-face corrugated fiberboard, extending 3 inches in from the edge on both surfaces of the dispenser and to a minimum thickness to provide a tight pack and a 1-inch clearance between the outermost projection of all surfaces of the dispenser and all adjacent inside surfaces of the container.

5.2.2 Level B. Each dispenser shall be packed as specified in 5.2.1, except the containers shall be domestic type and class.

5.2.3 Level C. Each dispenser shall be packed in a manner to insure carrier acceptance and safe delivery to destination at the lowest transportation rate for such supplies. Containers shall be in accordance with rules or regulations applicable to the mode of transportation.

5.3 Marking.

5.3.1 Civil agencies. In addition to special markings required by the contract or order, the interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military activities. In addition to special markings required by the contract or order, the interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Coverage. This Federal specification does not cover all types, styles, and sizes of dispensers but only those generally used by the Federal Government.

6.2 Ordering data. Purchasers should exercise any desired options offered herein, and procurement documents should specify the following:

(a) Title, symbol, and date of this specification.
(b) Type and size of dispenser (see 1.2.1).
(c) Mounting (see 1.2.2).
(d) Refrigeration system (see 1.2.3).
(e) Hot and cold water when required (see 1.2.4,, 3.3 and 3.19.5).
(f) Group and class designation if explosion-proof or dust-tight dispensers are required (see 1.2.5 and 3.19.4).
(g) Preproduction sample (see 3.1).
(h) Additional equipment when required (see 3.3).
(i) Required limiting dimensions if other than specified (see 3.4.2).
(j) Cooling and ice storage compartments when required (see 3.4.7).

(k) Cold water capacity (see 3.4.7).
(l) Cabinet finish if other than specified (see 3.7).
(m) Basin top (see 3.5.1).
(n) Number of bubblers required (see 3.8).
(o) Glass fillers, if required, (see 3.9).
(p) Stop valve operation, if other than specified (see 3.10.1).
(q) Type of cord and plug connector, if other than specified (see 3.14.4).
(r) Cleanable vacuum-break assembly if required (see 3.16.1.3).
(s) Water supply line pressure range, if other than specified (see 3.26).
(t) Identification marking if other than specified (see 3.18).

(u) Administrative provisions for inspection records (see 4.1).
(v) Required voltage and kind of current, including phases and frequency, if alternating-current. If 50-cycle dispensers with hermetic refrigerating systems are required, purchaser shall specify whether or not a correspondingly lower capacity and peak draw capacity will be acceptable in the event that a 60-cycle cooler is offered for 50-cycle operation.
(w) Preservation and packaging level (see 5.1 and 5.2).

6.3 Pre-award examination. Purchasing officers may, at their option, include the following paragraphs in their invitation to bid, contract, or order.

Pre-award examination. The purchaser shall have the right as part of the pre-award survey, to require any bidder upon twenty days notice, to make available to the purchasing officer or his representative, a sample of each item bid upon to determine compliance with the specifications. If the samples offered for examination are found not to be in conformity with the specifications, this may result in the rejection of an otherwise acceptable bid. Examination of samples will be made at the factory designated by the bidder in hi bid, unless otherwise specified in the invitation bid, contract or order.

6.4 Deviations from requirements. Purchasing officers may, at their option, include the following paragraph in their invitation to bid, contract or order.

Deviations from requirements. Any deviation from the general requirements and construction requirements (section 3) which provides quality equal or superior to the requirements of this specification, and which is noted as an exception by the contractor in his bid, will be given consideration. The burden of proof of such equal or superior quality shall rest on the contractor and the purchasing officer shall have the option of determining the validity of such proof by any means suitable to him.

6.5 Manufacturer's agent. Bidders should be required to supplement their bids with a list giving the names of the distributors or agents who will furnish the service referred to in 6.8 to the various stations listed in the invitation to bid.

6.6 Installation supervision and adjustment. Purchasing officers may, at their option, include the following paragraph in their invitation to bid, contract, or order:

The contractor shall provide the services of a representative to make all necessary adjustments of equipment at the time of installation.

6.7 The acceptance tests described in 4.5.1 to 4.5.12 inclusive, may be waived in the invitation to bid if the supplier submits test data showing that dispensers of the same kind have undergone those tests and have met the pertinent requirements. Dispensers may be modified but shall not be considered to be of the same kind if major alteration are made in them such as substitution of different motor-compressor units, different water-cooing units or different control system. Separate test data shall be required for dispensers in which such substitutions are made.

6.8 Transportation description. Transportation description applicable to these items is:

Water dispensers and cooling or freezing apparatus combined, in boxes or crates, or in packages 956 or 995, also on skids for pieces weighing each 3,000 pounds or over.

Carload weight 18,000 pounds, subject to Rule 34 of the current issue of Uniform Freight Classification No. 1

Truckload weight 18,000 pounds

Note: Package numbers referred to above are defined in the current issue of Uniform Freight Classification No. 1.

MILITARY INTERESTS:

Dept. of defense	-	DGSC
Army	-	GL
Navy	-	DOCKS
Air Force	-	SAAMA

OO-D-00566 (GSA-FSS)
Amendment-3
January 27, 1967
SUPERSEDING
Amendment-2 (GSA-FSS)
May 5, 1965

AMENDMENT

TO

INTERIM FEDERAL SPECIFICATION

DISPENSER, DRINKING WATER, MECHANICALLY COOLED

This amendment was developed by the General Services Administration, Federal Supply Service, Washington, D.C., 20406, based upon currently available technical information. It is recommended that Federal agencies use it in procurement in addition to Interim Federal Specification OO-D-00566 (GSA-FSS) dated July 28, 1964 and forward recommendations for changes to the preparing activity at the address shown above.

PAGE 1

Paragraph 1.2.1, after "Type VI-Bottle style, air-cooled" add "(to be used only when pressure type dispensers are impracticable)".

PAGE 2

After paragraph 1.2.5, add new paragraph:
"1.2.6 Definition of chamber. As used in this specification, chamber means the reservoir in which water is conditioned or stored at conditioned temperatures, or both, prior to being discharged by the dispenser in the quantities, within the temperature limitations, and at the rate specified. In no case should the use of the term "chamber" be construed as ruling out reservoirs other than tanks".

Paragraph 2.1, under Federal Specifications add: "UU-C-806, CUPS AND LIDS, PAPER, COLD DRINK".

PAGE 4

Paragraph 3.2, after "material and workmanship" insert "when specified (see 6.2) copper shall not be used in construction of the dispensers, or if used shall be limited a specified".

PAGE 6

Paragraph 3.4.2.1, delete in its entirety and substitute:
"3.4.2.1 Dimensions for wall hung dispensers. Unless otherwise specified (see 6.2) maximum dimensions of wall hung dispensers shall not exceed 19 inches in width, 15 inches in depth (projection from wall) and 25 inches in height when measured from the top of the flood rim of the basin to the bottom of the dispenser cabinet".

Paragraph 3.5.1 Basin tops. Delete in its entirety and substitute:
"3.5.1 Basin tops. The top of the cabinet for types I, II and VII dispensers, and for types III and IV dispensers which have top-mounted glass fillers, shall have a basin equipped with bubbler(s) and/or glass filler(s)

as specified in the invitation to bid (see 6.2), or as required by this specification. The strainer shall have openings not greater than 3/4 inch in any dimension, and shall not allow passage of a 17/64 inch diameter straight shank drill through the openings,using hard pressure. If the strainer is made of different material from the basin top, it shall either be made of corrosion-resisting steel or chromium-plated metal. The basin shall have rounded corners and shall be so proportioned as to prevent splashing of the bubbler stream at the minimum water flow rates specified in 3.26.1. The basin with strainer in place shall be so designed as to allow complete drainage with no accumulation of water to remain when cabinet is in operable vertical position. The basin shall be constructed of corrosion-resisting steel, unless otherwise specified in the invitation to bid (see 6.2). Tops shall be free from wrinkles and waves, and all edges and corners shall be accurately formed without sharp edges. Tops shall fit snugly and conform to the cabinet. Tops of wall hung and wall flush

mounted dispensers shall have a raised edge on the back, at least 3/4 inch higher than the other three sides, and designed to prevent water from splashing on the wall or running down between dispenser and wall.

PAGE 9

Paragraph 3.12.3, Materials of construction, at the end of the third sentence following "....type L tubing (WW-T-799)" insert "or shall be plated with tin, nickel, or chromium on the side in contact with water".

PAGE 12

Add a new subparagraph:

"3.18.3.1 Service warning plate for Type VI bottle style dispensers. A service warning plate of metal or plastic shall be permanently attached above the faucet on the front outside of the dispenser cabinet or rack of Type VI dispensers. It shall be printed in upper case letters 1/4 inch high and shall read as follows:

PERSONS SERVICING THIS DISPENSER SHALL BE EXTREMELY CAREFUL. WHEN FILLING THE BOTTLE USE ONLY POTABLE WATER FROM A SAFE SOURCE, AND WHEN FILLING AND INSERTING THE BOTTLE DO NOT CONTAMINATE THE WATER BY TOUCHING THE BOTTLE NECK NOR PERMITTING ANY FOREIGN MATTER TO ENTER THE BOTTLE OR THE WATER CHAMBER OF THE DISPENSER. THE WATER CONTAINERS MUST BE STERILIZED BY AN APPROVED METHOD WITH CHLORINE OR CAUSTIC PRIOR TO EACH REFILLING. WHEN FILLING THE BOTTLE, AN UNUSED, CLEAN, NEW PAPER CUP CONFORMING TO UU-C-806, STYLE E, SHALL BE PLACED OVER THE END OF THE BOTTLE NECK IMMEDIATELY AFTER THE BOTTLE IS FILLED, AND REMOVED AFTER THE BOTTLE IS RESTED ON ITS SHOULDER ON THE EDGE OF THE DISPENSER PRIOR TO COMPLETION OF THE INSERTION".

PAGE 13

Paragraph 3.20.6, after "Type VI, Bottle style". Insert:

"Type VI, bottle style dispensers shall only be used when it is not practicable to use pressure type dispensers".

PAGE 15

Paragraph 3.22, line 4: Following———type VII dispensers shall operate with ———delete "100" and substitute "110".

PAGE 19

Paragraph 4.3.1.3.1. Visual Examination, under DEFECTS, MINOR TOP:

"Openings in strainer for drain more than 1/4 inch in diameter"; and substitute, "Openings in strainer for drain are more than 3/4 inch in any dimension or allow passage of a 17/64 inch diameter straight shank drill".

PAGE 22

Paragraph 4.4.2, fifth line, following "75 p.s.i.g" insert "except for Type VI bottle style dispensers. Type VI dispensers shall be tested with a filled 5-gallon water bottle in place, or a continuous water supply of equivalent pressure".

PAGE 23

Paragraph 4.5.3, line 16: Last line on bottom page, insert the number "20" between "made at" and "minute intervals".

Paragraph 4.5.9.3, lines 3 and 6: Following "table" delete "VI" and substitute "VII".

PAGE 29

Paragraph 6.2 (i) delete "(see 3.34.2)" and substitute "(see 3.4.2 and 3.4.2.1)".

PAGE 30

Paragraph 6.2, Add new purchaser's option; "(w) Required restrictions on the use of copper, if any, and substitute materials to be used in place of copper (see 3.2)".

Delete paragraph 6.8 Transportation description in its entirety and substitute:

"6.8 Note. The improper handling and replacement of water bottles in inverted bottle type drinking water dispensers is considered by the U.S. Public Health Service of the Department of Health, Education and Welfare to be unsanitary and conducive to contamination of potable water. However, where there are no substitute devices available, it is recommended that these dispensers be used only when it is impracticable to use a pressure type dispenser, and then only as directed on the plate attached to the front of the dispenser. Water for filling the bottle must come only from a safe source of potable water. None of the above is to be interpreted as a condemnation of the proper handling of safe bottled water by bottled water companies regularly inspected and approved by State Health Departments".