

GG-D-465A  
February 18, 1977  
SUPERSEDING  
Fed. Spec. GG-D-465  
July 25, 1957

## FEDERAL SPECIFICATION

### DISTILLING APPARATUS, LABORATORY

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

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers water distilling apparatus for laboratory use, having a self-contained electrical heating device, horizontal type shell and tube condenser, and capable of producing distilled water meeting the requirements for purified water as specified in the Pharmacopoeia of the United States.

1.2 Classification. The distilling apparatus shall be of the following sizes as specified (see 6.2).

Size 3 - 3 gallon per hour  
Size 5 - 5 gallon per hour

#### 2. APPLICABLE DOCUMENTS

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

##### Federal Specifications:

QQ-B-613	- Brass, Leaded and Non-Leaded, Flat Products, (Plate, Bar, Sheet and Strip).
QQ-C-390	- Copper Alloy Castings (Including Cast Bars).
QQ-C-576	- Copper Flat Products, with Slit, Slit and Edge Rolled, Sheared, Sawed or Machined Edges (Plate, Bar, Sheet, and Strip).
QQ-N-281	- Nickel-Copper Alloy Bar, Rod, Plate, Sheet, Strip, Wire, Forgings, and Structural, and Special Shaped Sections.

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- QQ-S-766 - Steel Plate, Sheet, and Strip, Corrosion Resisting.
- QQ-T-371 - Tin; Peg.
- WW-P-460 - Pipe-fittings; Bronze (threaded) 125- and 250-Pound.
- WW-T-799 - Tubing, Copper, Seamless, Water and Refrigeration (for use with Soldered, Flared or Compression-type Fittings).
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-1055 - Barrier Material, Waterproofed, Flexible.

## Military Specifications:

- MIL-M-7298 - Manual Technical, Commercial Equipment.

## Federal Standards:

- Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).
- Fed. Test Method Std. 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 prices 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, US Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(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 Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(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 or request for proposal shall apply.

Underwriters' Laboratories, Inc.

UL-1262 - Standard for Laboratory Equipment (for non-patient contact)

(Application for copies should be addressed to the Underwriters' Laboratories, Inc., 1285 Wall Whitman Road, Melville, L.I., NY 11746; 207 E. Ohio Street, Chicago, ILL 60611; or 1655 Scott Blvd., Santa Clara, CA 95050.)

U.S. PHARMACOPEIAL CONVENTION, INC.

The United States Pharmacopeia.

(Application for copies should be addressed to the Mack Publishing Company, Easton, PA 18042).

OFFICIAL CLASSIFICATION COMMITTEE

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd Street, New York, NY 10016.)

AMERICAN TRUCKING ASSOCIATION

National Motor Freight Classification Rules.

(Application for copies should be addressed to the American Trucking Association, 1616 P Street N.W., Washington, DC 20036.)

### 3. REQUIREMENTS

3.1 Materials. Materials shall meet the chemical requirements of their respective specifications, when tested as specified in 4.4.2.

3.1.1 Sheet metal. The sheet metal, where specified, shall be either copper, corrosion-resisting steel or nickel copper alloy.

3.1.1.1 Copper sheets. Copper sheets shall be hard, cold rolled, conforming to QQ-C-576.

3.1.1.2 Nickel-copper alloy sheets. Nickel-copper alloy sheets shall conform to QQ-N-281, class A, cold-rolled, satin finished.

3.1.1.3 Corrosion-resisting steel. Corrosion-resisting steel shall conform to QQ-S-766, class 302 or 304, finish 4.

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3.1.2 Brass plates. Brass plates shall conform to QQ-B-613, composition I, condition quarter hard.

3.1.3 Copper tubing. Copper tubing shall conform to WW-T-799, type K.

3.1.4 Tin. Tin shall conform to QQ-T-371.

3.1.5 Brass and bronze fittings. Brass and bronze fittings shall conform to WW-P-460.

3.1.6 Bronze castings. Bronze castings shall conform to QQ-C-390, alloy B5.

3.2 Design and construction. The distilling apparatus shall consist of an evaporator with heating device, condenser, constant level device, deconcentrator, and other equipment necessary for the proper function of the apparatus. The evaporator and condenser shall be connected by means of a vapor pipe. The condenser shall be horizontal and located above the evaporator. A wall mounting bracket shall be furnished when specified in the invitation for bids.

3.2.1 Evaporator. The evaporator shall be of the vertical, cylindrical double wall type with air-insulating space. The evaporator shall be of sufficient height and width to provide ample vapor disengaging space and operation at low velocity.

3.2.1.1 Inner-shell. The inner shell (boiler) shall be, seamed or seamless sheet copper (3.1.1.1), and shall be securely fastened to the base (3.2.1.3). The inner shell dimensions shall be as specified in table I.

TABLE I. Inner shell dimensions.

Size (gallons per hour)	Diameter (inches, minimum)	Height (inches, minimum)
3	7-15/32	18
5	10-7/16	23

3.2.1.2 Outer shell. The outer shell shall be fabricated from corrosion resisting steel (3.1.1.3) having a minimum thickness of 0.025 inch. The outer shell shall be securely fastened to the base. (3.2.1.3). The outer shell dimensions shall be as specified in table II.

TABLE II. Outer shell dimensions.

Size (gallons per hour)	Outside diameter (inches, minimum)	Height (inches, minimum)
3	8-3/4	24
5	12	30

3.2.1.3 Base. The base shall be cast bronze (3.1.6) having a minimum thickness of 0.125 inch. If a wall mounting bracket (3.2) is not specified, the base shall be fitted with three or more suitable legs for mounting on a table or other horizontal surface.

3.2.1.4 Cover. The cover shall be a round bronze or brass (QQ-C-390) casting having a minimum thickness of 0.125 inch. The cover shall be removable and shall have a central opening with a collar and threaded shoulder to receive the threaded end of the vapor pipe (3.2.6). The external surface of the cover shall be nickel plated polished or satin finish.

3.2.1.4.1 Baffle. The baffle shall be made of sheet copper (3.1.1.1). Unless otherwise specified, the baffle shall be of the "Spanish Prison" design consisting of a star-shaped arrangement of vertical vanes having staggered slots, all enclosed in a cylindrical or truncated shell as a complete unit. The steam shall be directed vertically into the baffle and shall be required to make at least 10 180 deg. horizontal reversals in direction.

3.2.2 Constant level device. The constant level device shall have no moving parts. It shall be a compact assembly of adequate capacity for automatically controlling the level of water in the boiling chamber. It shall be equipped with an overflow drain and shall provide a constant water level of approximately one-third the free space of the boiling chamber. The distance between the top of the heating element and the overflow pipe shall be a minimum of 3/4 inch to insure that the heating elements are always submerged.

3.2.3 Deconcentrator. The deconcentrator or bleeder device shall bleed water from the boiling chamber at a height just below the normal operating water level as determined by the overflow drain when the unit is cold. A valve shall be provided for regulating the rate of water being bled.

3.2.4 Gage glass. A suitable gage glass shall be provided for the 5 gallon per hour size. The gage glass shall be protected by suitable nickel plated, brass rods.

3.2.5 Distillate cooler. A distillate cooler shall be provided with the 5 gallon per hour size.

3.2.6 Vapor pipe. The vapor pipe shall be fabricated of nickel-copper alloy, copper or brass having a minimum thickness of 0.065. One end of the vapor pipe shall be threaded to mate with the thread of the cover (3.2.1.4) the other end shall mate with the elbow of the condenser. (3.2.7).

3.2.7 Condenser. The condenser shall be a nickel-copper alloy, copper or brass, and shall consist of a shell and tube section enclosed by a jacket. The wall thickness of the condensing tube shall have a minimum

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thickness of 0.035 inch. The distillate delivery tube shall be connected to the undersurface of the discharge end for conducting the distillate into a collecting receptacle. The tube shall be pure block tin (3.1.4), have a minimum length of six inches, and of sufficient inside diameter for the size of the still. A vent shall be provided at the end of the condenser to permits the escape of uncondensed vapors and gaseous impurities. When necessary, to properly support the condenser, a support bracket shall be fitted between the condenser and the evaporator. The condenser shall be fitted with an elbow, soldered to the condenser and threaded at the other end, for connecting to the vapor pipe. As an alternate, the elbow shall be soldered to the vapor pipe. When vapor pipe is attached by soldering, threading is not required. The condenser shall have the minimum cooling areas specified in table III.

TABLE III. Minimum condenser cooling areas.

Size (gallons per hour)	Area (sq. ft.)
3	1.77
5	2.89

3.2.8 Pipes, valves, and fittings. Pipes, valves and fittings shall be brass, bronze or copper. Where exposed, they shall be nickel or chromium plated. When chromium plating is used, it shall be applied over nickel plating.

3.2.9 Joints and seams. All joints shall be of the slip type, securely sweated-in with solder. All seams shall be of the lock-type, securely sweated together with solder. Joints with which the distillate comes into contact shall be made of pure tin or silver-tin alloy solder. All soldering shall be continuous, completely filling the space between the parts joined, and shall extend over the protruding portion, providing a smooth, even surface from which foreign matter may be easily removed. Castings and other parts shall fit accurately. Material joined shall be of such composition as not to cause galvanic corrosion.

3.3 Protective coating. All metal parts that come in contact with the vapor or distillate shall be coated with pure block tin (3.1.4), having a minimum thickness of 0.0001 inch.

3.4 Finish. All exposed metal parts, except those of corrosion-resisting steel or nickel-copper alloy, shall be suitably coated to resist corrosion.

### 3.5 Electrical requirements.

3.5.1 Heating elements. The heating elements shall be of the immersion type and shall consist of a straight or helically coiled nickel-chromium or nickel-chromium-iron resistance wire, embedded and surrounded by heat-conducting and electrical-insulating material of durable quality suitable for the use intended, and a copper tubing sheath. The copper tubing sheath shall enclose, with good thermal contact, the embedded heating element. The length

of the sheath shall be a nominal 24 1/4 inches for the three gallon per hour still and 36 1/4 inches for the five gallon per hour still. The sheath shall cover and fully protect the heating element and embedding material from contact with liquid. The heating elements shall be rated for 115-volt operation on both alternating and direct current, and shall consume the specified power within a tolerance of +/- 5 percent when tested as specified in 4.4.3. Each heating element shall be permanently and legibly marked with the voltage, wattage and manufacturer's name or registered trademark. The heating elements shall be supplied in the quantities and power ratings for still sizes specified in table IV.

TABLE IV. Sizes of heating elements.

Still Size (gallons per hr)	Number of elements per still	Rating (WATTS) per element	Number of spare elements to be supplied
3	6	1300	3
5	6	2160	3

3.5.2 Operating voltage. The distilling apparatus shall be capable of operating on 115-230 volts alternating or direct current circuits.

3.5.3 Terminal block. A terminal block of rugged construction, or other suitable means, shall be provided for connecting leads to the units.

3.6 Dielectric withstand. The distilling apparatus shall be capable of withstanding without break-down, for one minute, a potential of 1240 volts, 60 Hz applied between live and dead metal parts when tested as specified in 4.4.2.

3.7 Accessories. A wrench of suitable size, design, and length shall be supplied with each distilling apparatus for the replacement of the heating elements.

3.8 Performance. Each distilling apparatus shall produce distillate at not less than rated capacity, and shall conform to the applicable requirements in table V for the size specified, when tested as specified in 4.4.1.

TABLE V. Performance requirements.

Size (gallon per hour)	Cooling water consumption per gallon of distillate produced (maximum)	Kilowatt hour per gallon of distillate
3	9	2.7
5	9	2.7

3.8.1 Purity. The distilling apparatus shall produce distillate, obtained from the dilution of an 0.1 percent solution of sodium chloride, which shall meet the requirements of the United States Pharmacopeia for purified water. When tested as specified in 4.4.1.

3.9 Marking.

3.9.1 Nameplate. A suitable nameplate, permanently indented or embossed, shall be securely attached on the distilling apparatus to a part which will not ordinarily be renewed during the normal service life of the equipment. It shall be located in a readily accessible position where it can be read at all times without danger to personnel.

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3.9.2 Nameplate markings. Data marked on nameplate shall include the following:

- (1) Manufacturer's name or registered trade-mark, serial number, letters US, and contract number.
- (2) Characteristics:
  - (a) Capacity per hour.
  - (b) Voltage, amperage, wattage and wiring connections.
- (3) Such other data as may be required by Federal or State laws.

3.9.3 Wiring diagram. A suitable plate, stenciled or embossed, shall be securely installed on the distilling apparatus showing the wiring diagram and clearly indicating the proper connections for operation at any of the operating voltages specified in 3.5.2. A paper sign, printed in red, shall be attached with waterproof adhesive, on the front of the distilling apparatus to read as follows:

WARNING

This distilling apparatus will  
not operate until wiring is  
completed for current available.

3.9.4 Instructions. A complete and detailed set of installing, operating, cleaning, and maintenance instructions, and detailed instructions for installing replacement electric heating units, shall accompany each distilling apparatus.

3.10 Service data. The contractor shall furnish, with each unit, two copies each of a technical manual which contains complete instructions for installation, operation, and maintenance and lists of component parts. The manual shall comply with the requirements of MIL-M-7298 Manual Technical: Commercial Equipment. As soon as practicable after award of the contract or purchase order, the contractor shall furnish to the Contracting Officer, via the cognizant Government inspector, two preliminary copies of his proposed technical manual, for review and comment by the Directorate of Medical Materiel, Defense Personnel Support Center. The preliminary manuals shall be submitted sufficiently early to permit adequate review by the Directorate of Medical Materiel, Defense Personnel Support Center (based on a maximum period of 30 days for such review) and to allow incorporation by the contractor of any required revisions and corrections in the final manual without delaying delivery under the contract or purchase order. In addition, the contractor shall furnish 15 copies of the approved technical manual to the Contracting Officer for distribution. Should the supplier have furnished acceptable manuals for the identical item within two years preceding the date of contract and propose to furnish manuals identical with those previously accepted, then the requirements for review of drafts and submission of 15 additional copies may be waived upon request to the Contracting Officer. Waiver of submission of 15 additional copies shall be at the option of the Government.



### 3.11 Fire and casualty hazards.

3.11.1 The contractor shall submit proof, prior to delivery, that the items to be delivered under the contract conform to the applicable requirements of UL Standard No. 1262. Proof shall consist of one of the following:

- a. The UL label or the UL listing of the product, provided the contractor agrees to have Underwriters' Laboratories, Inc. forward a copy of the UL report directly to the Contracting Officer, upon the latter's request.
- b. Laboratory report from a qualified independent laboratory. If an independent laboratory is used, it shall be adequately equipped and competent to determine compliance with UL standards. The qualifications of such laboratory shall be determined by the Government, which reserves the right to require a facilities report and to conduct a facilities survey. Any laboratory report submitted shall include actual test methods, data taken, and results of tests. Detailed findings of examinations necessary to determine compliance shall also be included. The test report shall also have a section that describes the test sample in such a way that the report can be used to insure identity of production items with the test sample. This section shall be supplemented with construction information such as materials used, spacing between electrical components, types of bushings, photographs, wiring diagrams, sketches and parts, all appropriately identified.
- c. Compliance with Underwriters' Laboratories, Inc., requirements regarding fire and casualty hazards does not absolve the contractor from complete compliance with the requirements of this specification in order to secure the acceptance of the commodity.

3.12 Workmanship. Workmanship shall be first class throughout. Item shall be free from defects which detract from its appearance or may impair its servicability. All burrs and sharp edges shall be removed the from the item.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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4.1.1 Records. Records of examinations and tests performed by or for the contractor shall be maintained by the contractor and made available to the Government, upon the Government's request, at any time, or from time to time, during the performance of the contract and for a period of three years after delivery of the supplies to which such records relate.

4.1.2 Inspection. Inspection, as used in this specification, is defined as both examination (such as visual and auditory investigation without the use of special laboratory appliances or procedures) and testing (determination by technical means of physical and chemical properties) of the item.

4.1.3 Certificates of quality. Certificates of quality, supplied by the manufacturers of the steel, copper, nickel-copper, brass, bronze and tin may be furnished in lieu of actual performance of such testing by the contractor, provided lot identity has been maintained and can be demonstrated to the Government. The certificate shall include the name of the contractor, the contract number, the name of the manufacturer or supplier, the NSN, the Item Identification, the name of the component/material, the lot number, the lot size, the sample size, the date of testing, the test method, individual test results, and the specification requirements.

## 4.2 SAMPLING

4.2.1 For examination. Sampling for examination shall be conducted in accordance with MIL-STD-105, and table VI. The unit of product for sampling purposes shall be one complete distilling apparatus.

TABLE VI. Sampling for examination.

Examination	Inspection level	AQL (percent defective)
Major	II	1.0
Minor	II	2.5
Dimensional	S-2	2.5

4.2.2 Sampling for tests. Sampling for tests shall be conducted in accordance with MIL-STD-105 and table VII, except that the acceptance number shall be zero for all sample sizes. The unit of product shall be one completed distilling apparatus.

TABLE VII. Sampling for tests.

Characteristic	Requirement	Test procedure	Inspection level
Performance	3.8	4.4.1	S-2
Dielectric withstand	3.6	4.4.2	100 percent
Wattage of heating unit	3.5.1	4.4.3	S-3

## 4.3 Examination.

4.3.1 Distilling apparatus. The distilling apparatus shall be examined for defects including, but not limited to those listed in table VIII.

TABLE VIII. Classification of defects.

Catagories	Defects
Major:	
101	Component part missing.
102	Distilling apparatus not free of sharp edges.
103	Soldering not free of cracks or porosity.
Minor:	
201	Metal surfaces not free of dents.
202	Identification markings missing, incomplete, incorrect, illegible and nonpermanent.

4.3.2 Dimensional. The distilling apparatus shall be examined for defects in dimensions. Any dimensions not within the tolerance specified herein shall be classified as a defect.

4.3.3 Preparation for delivery. An examination shall be made to determine whether the packaging, packing, and marking comply with the requirements of Section 5. Defects shall be scored as specified in table IX. Sampling shall be in accordance with MIL-STD-105. The sample unit shall be one container fully prepared for delivery. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 and the acceptable quality level shall be 4.0 expressed in terms of percent defective.

TABLE IX. Examination of preparation for delivery.

Examination	Defect
Containers	Not as specified.
Quantity	Quantity in interior packages and shipping containers not as specified.
Packaging and packing materials	Any component missing or damaged.
Workmanship	Inadequate application of components, or containers distorted.
Markings	Omitted, incorrect, illegible, improper size, location, sequence, or method of application.

4.3.3.1 Examination of closure of shipping containers. When shipping containers are required to comply with PPP-B-601 or PPP-B-621, examination for defects in closure shall be in accordance with the appendix of the appropriate box specification.

4.4 Tests. Tests shall be conducted to determine compliance with requirements specified herein.

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4.4.1 Performance test. To determine conformance to the requirements of paragraph 3.8, distilling apparatus shall be operated under normal conditions until all parts have attained maximum operating temperature. The supply of cooling water shall then be adjusted to produce distillate at no less than rated capacity, and the distilling apparatus shall then be operated continuously for 24 hours, or for a period of 8 hours per day for three successive days. Measurements shall be taken hourly. At some time during the distillation a 0.1 percent solution of sodium chloride shall be substituted for the tap water and USP tests for purified water shall be performed on the distillate produced from the salt water.

4.4.2 Dielectric withstand. A slowly rising potential, from 0 to 1240 volts, 60 Hz, shall be applied between live and dead metal parts. This potential shall be maintained at maximum for one minute. There shall be no evidence of breakdown.

4.4.3 Heating unit wattage. The heating unit shall be connected to 115 volts, 60 Hz and 115 volts Direct Current supply and the wattage determined. The wattage shall be as specified in 3.5.1.

## 5. PREPARATION FOR DELIVERY

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

### 5.1.1 Level A.

5.1.1.1 Unit preparation. Each distilling apparatus shall be disassembled as far as is practicable. Condenser shall be removed from body of distilling apparatus. All exterior finished surfaces shall be protected by wrapping with barrier material and cushioning with flexible corrugated fiberboard or other suitable materials. Wrapping and cushioning material shall be secured by tying or taping. Work shall be accomplished in such a manner as to insure against marring, scratching, or damage to the unit. Component parts shall be packaged in one or more fiberboard boxes or wood boxes of suitable size and design. Containers shall be adequately secured to prevent accidental opening, and shall contain sufficient cushioning material to prevent shifting and breakage. Fiberboard boxes shall be wrapped, and wood boxes shall be lined waterproof barrier material conforming to the requirements of PPP-B-1055.

5.1.2 Level B. Each distilling apparatus shall be disassembled as far as practicable to prevent abrasion and damage in shipment. Component parts of the unit that may come loose in handling and transit shall be secured in place with tape, fiberboard forms, packing clips or other suitable means. Alternatively, parts that are removed shall be individually wrapped in non-abrasive material and packed in a fiberboard box. Each distilling apparatus shall be covered with a full length bag made of polyethylene film having a minimum thickness of 2 mils.

5.1.3 Level C. Each distilling apparatus shall be prepared for packing to insure adequate protection against abrasion and damage during shipment.

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

5.2.1 Level A. Each distilling apparatus shall be overpacked in an exterior container designed for a type 3 load, and constructed in accordance with PPP-B-601, overseas type or PPP-B-621, class 2. Each apparatus shall be adequately secured within the exterior container by means of bolts, braces, or other interior fittings to insure against shifting, breakage, or marring or denting of surfaces. Adequate cushioning material shall be used between all bracing and the apparatus. Boxes containing disassembled components or spare parts, shall be secured to base of exterior containers; no parts shall be packed within the distilling apparatus. All box panels, except base, shall be lined with waterproof barrier material conforming to the requirements of PPP-B-1055 in such a manner as to prevent entry of water. The exterior container for the size 5 distilling apparatus shall be provided with skids as specified in the applicable box specification. Closure and strapping of the exterior container shall be as specified in the applicable box specification.

5.2.2 Level B. Each distilling apparatus, packaged as specified in 5.1.2, shall be packed in a tight-fitting box conforming to PPP-B-636, style FOL, type CF, class domestic, variety optional, minimum grade 275. Internal shock absorbing packing pads, molded or folded, shall be used to secure the unit in place and to provide not less than 3/4 inch clearance between any part of the inside surfaces of the box. In addition, "L" shaped fiberboard corner pads, extending the full inside height of the box shall be used in all four corners of the pack for added stacking strength. Any component parts of the distilling apparatus, packed as specified in 5.1.2, shall be secured within the pack to prevent movement, abrasion and damage during handling and shipment. The box shall be closed in accordance with the appendix to PPP-B-636.

5.2.3 Level C. Each distilling apparatus packaged as specified in 5.1.3, shall be packed in a box that will assure acceptance and safe delivery in compliance with National Motor Freight Classification or the Uniform Freight Classification for the item.

5.3 Marking. Marking shall be in accordance with 5.3.1 and 5.3.2 as specified (see 6.2).

5.3.1 Civil agencies. Each shipping container shall be marked in accordance with Fed. Std. 123.

5.3.2 Military activities. Each shipping container shall be marked in accordance with MIL-STD-129.

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5.3.3 Special marking. In addition to the marking specified in 5.3.1 or 5.3.2 each shipping container shall be marked as follows:

(a) On a side panel:

UP  
LAB EQUIPMENT - GLASS  
FRAGILE, HANDLE WITH CARE

(b) In the upper corner of both end panels, a standard up arrow.

(c) On the top panel:

TOP  
THIS SIDE UP

5.3.2.1 Interior packages. Interior package shall be marked to identify contents.

5.3.2.2 Exterior container. Each exterior container shall be marked as specified in MIL-STD-129.

## 6. NOTES

6.1 Intended use. The distilling apparatus covered by this specification is intended to produce single distilled water conforming to the requirements of the latest revision of the United States Pharmacopeia under "Purified Water", and it is not required to produce distillate of a quality suitable for use in analytical chemical work.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents.

- a. Title, number, and date of this specification
- b. Nation stock number (NSN).
- c. Packaging level required (see 5.1).
- d. Packing level required (see 5.2).
- e. Type of marking required (see 5.3).
- f. Wall bracket when required.

### National Stock Numbers

### Item Identification

6640-00-440-4882

Distilling Apparatus, Laboratory, Water  
Electrically Heated 3 gal., 115-230 volt,  
AC - DC.

6640-00-440-4916

Distilling Apparatus, Laboratory,  
Water, Electrically Heated, 5 gal.,  
115-230 volt, AC - DC.

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MILITARY CUSTODIANS:

Army - MD

Navy - MS

Air Force - 03

Preparing activity:

DSA-DM

Civil Agency Coordinating Activities:

GSA-FSS

Project No. 6640-0996

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Orders for this publication are to be placed with General Services Administration, acting as agent for the Superintendent of Documents. See Section 2 of this specification to obtain copies of documents referenced herein. Price 45 cents each.