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June 30, 1986
SUPERSEDING
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FEDERAL SPECIFICATION

TOASTER, ELECTRIC, POP-UP/POP-DOWN, HEAVY-DUTY, INTERMITTENT

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers type HDI (heavy-duty, intermittent) electric pop-up and pop-down toasters, employed in the toasting of sliced bread. Toasters are of the heavy-duty type, requiring rugged construction to withstand rough handling.

1.2 Classification.

1.2.1 Types. Electric toasters shall be of the following classes, types, and styles, as specified (see 6.2):

Class 1 - Pop-up
Class 2 - Pop-down

Type HDI-100 - 100 slices per hour capacity, 2 slices
Type HDI-200 - 200 slices per hour capacity, 4 slices

Style 1 - Shipboard use
Style 2 - Shore use

2. APPLICABLE DOCUMENTS

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

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

AMSC N/A FSC 7310

Federal Specifications:

PPP-B-601	-	Boxes, Wood, Cleated-Plywood
PPP-B-621	-	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	-	Boxes, Shipping Fiberboard
PPP-B-640	-	Boxes, Fiberboard, Corrugated, Triple-Wall

Federal Standard:

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

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

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

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

Military Specifications:

MIL-P-116	-	Preservation, Methods Of
MIL-E-17555	-	Electronic and Electrical Equipment, Accessories, and repair Parts; Packaging and Packing Of

Military Standards:

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-147	-	Palletized Unit Loads

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

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

American Iron and Steel Institute (AISI)

Steel Products Manual

(Application for copies should be addressed to the American Iron and Steel Institute, 150 East Forty-Second Street, New York, NY 10017.)

National Electrical Manufacturers' Association (NEMA)

WD 1-1983 - General Purpose Wire Devices

(Application for copies should be addressed to the National Electrical Manufacturers' Association, 2101 L Street, N.W., Washington, DC 20037.)

American Society for Testing and Materials (ASTM)

ASTM D 3951 - Standard Practice for Commercial Packaging

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

Underwriters Laboratories, Inc. (UL)

UL 197 - Commercial Electric Cooking Appliances

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

National Sanitation Foundation (NSF)

No. 4 - Electric Commercial Cooking and Warming Equipment
Listing of Food Service Equipment

(Application for copies should be addressed to the National Sanitation Foundation, NSF Building, Ann Arbor, MI 48105.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 First article inspection. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.3).

3.2 Codes and standards. The toasters shall comply with the applicable requirements of Underwriters Laboratories Standard No. 197 and the applicable requirements of National Sanitation Foundation Standard No. 4 (see 4.4.6, 4.6.6.1, and 4.4.6.2).

3.3 Material. Recycled material may be used (see 6.4).

3.3.1 Metal parts. Metal parts shall be sufficiently sturdy to withstand normal usage without permanent deflection or breakage. Springs and unplated ferrous-metal screws or bolts shall not be used as current-carrying parts.

3.3.2 Plastic parts. Plastic parts used for electrical insulation shall be of material selected for good dielectric properties, low-moisture absorption, and heat resistance. Plastic for operating handles and supporting feet shall be selected for suitable mechanical strength.

3.4 Design. Class 1 toasters shall be of the vertical oven pop-up design in which slices of bread are inserted into slots at the top of the toaster and, when properly browned, are automatically raised. Class 2 toasters shall drop the toast into a receiving tray. An individual slot and toasting oven shall be provided for each slice of bread. Toasters shall be capable of toasting bread slices as small as 4 1/4 by 4 1/4 inches or as large as 5 by 4 1/2 inches. All adjustments devices and hand controls shall be located at the front of the toaster and shall be of simple enough design to be adjusted by the operator. The toaster shall be equipped with a timing mechanism that can be adjusted by the operator to provide continuous production of "light", "medium", or "dark" toast.

3.4.1 Type HDI-100. Toasters shall be dived into two sections and arranged to toast two slices of bread on both sides at a time. Total weight shall not exceed 20 pounds.

3.4.2 Type HDI-200. Toasters shall be arranged to toast two to four slices of bread on both sides at a time. They shall have a separate operating and timing mechanism for each two slices of bread. Total weight shall not exceed 35 pounds.

3.5 Construction. The toaster-body outer case shall have a minimum thickness of No. 18 U.S. standard sheet gage steel (0.0478 inch) chromium plated or corrosion-resisting steel conforming to AISI type 302 or 304, as listed in the Steel Products Manual, with a minimum thickness of No. 22 U.S. standard sheet gage steel (0.0329 inch). All parts of the toaster shall be corrosion resistant. The back and sides of the outer case shall be without vent openings. Toasters shall be sufficiently reinforced to prevent movement of parts after assembly. Sheet-metal screws shall not be used where disassembly is necessary for servicing. It shall be possible to replace defective parts without the use of special tools. Operating and timing mechanisms shall be readily accessible and replaceable as units. Toasters shall be composed of the toaster body, toast carrier, crumb tray/receiving tray, and cord (type HDI-100) or terminal box (type HDI-200). The toasters shall be sufficiently durable to withstand dropping to hard surfaces (see 4.5.2).

3.5.1 Toast carrier. Toast carriers shall be provided to guide each slice of bread into proper position for toasting and discharging it when toasted. They shall be of the basket type or shall operate between suitable guides. Support shall be provided at all times for the bread, which shall not be dislodged from the toaster at any time when the toaster is rotated in any direction through an angle of 15 degrees from the vertical. Toast carriers shall be suitably reinforced and of rigid construction. They shall be lowered to the toasting position either manually or automatically. When lowered manually, they shall be operated by a lever at the front of the toaster. When lowered automatically, they shall be operated by insertion of the bread in the toast carrier. When the toast carrier is lowered to the toasting position, the timing mechanism or thermostat shall be actuated and the heating elements energized.

3.5.2 Crumb tray/receiving tray. A sliding crumb tray designed for the ready removal of crumbs shall be provided for class 1 toasters underneath the toast carrier. The crumb tray shall have a fixed handle and stops. The tray may form the bottom plate of the toaster. The tray shall be capable of being withdrawn for cleaning without the use of tools. For cleaning purposes, the tray shall be removable or capable of being easily cleaned without being completely removed. The receiving tray for class 2 toasters shall be designed to collect the toasted bread slices and shall be fabricated from stainless steel or a durable, molded, high impact material that is easily cleaned.

3.5.3 Operating levers, hand adjustment knobs, and supporting feet. The operating-lever handle and hand-adjustment knobs shall be of plastic material. The temperature of the operating-lever handle shall not exceed 125 deg. F (with a normal ambient temperature of 75 deg. F) when the toaster is operating at its maximum rate. The toaster shall have supporting feet of plastic or hard rubber. Tapped holes, drilled lugs, or other suitable means shall be provided for securing shipboard toasters no less than 4 inches above countertops. Metal inserts shall be used in holes tapped into plastic feet.

3.5.4 Switches. Switches shall break both sides of the line, shall be suitable for the number of toasting cycles required, and shall not show an appreciable change (plus or minus 5 percent) in the contact resistance during the required life tests (see 4.5.3).

3.5.5 Heating elements. Individual heating elements shall operate across the line voltage and shall be easily removable in the event that replacement becomes necessary. Elements shall be designed for only one method of installation so that they cannot be incorrectly replaced. Like elements shall be interchangeable. When assembled in the toaster, the heater elements shall be fixed in position so that they cannot be disloged by shock or jar. Resistance wire or ribbon shall terminate in, and shall be securely fastened to lugs attached to wiring terminals, so that it will not be necessary to fasten the ends of the wire by twisting them about terminals.

3.5.6 Electrical connections.

3.5.6.1 Type HDI-100. Toasters designed for 120 V, 60 Hz, single phase power, shall have a 6-foot power supply cord and a NEMA 5-15P plug connected to the end of the cord. Toasters designed for 208 V, 60 Hz, single phase power shall have a 6-foot power supply cord and a NEMA 6-15P plug connected to the end of the cord.

3.5.6.2 Type HDI-200. Toasters shall be furnished without cord and plug connections. A steel terminal box with a detachable cover, provided at the rear of the type HDI-200 toaster only, shall contain terminals for permanent connection to the wiring system. This box shall also contain a ground terminal connected to the toaster outer case.

3.6 Electrical characteristics.

3.6.1 Voltage. Toasters shall operate on one of the following voltages as specified (see 6.2):

a. 115 V, 60 Hz, single phase.
b. 208 V, 60 Hz, single phase.
c. 230 V, 60 Hz, single phase.
d. 115 V dc.
e. 115 V, 50 Hz, single phase - for Japan.
f. 220 V, 50 Hz, single phase - for Europe.

3.6.2 Electrical input. Toasters shall have the following maximum wattage input when operating at any time following the completion of five consecutive cycles of operation:

a. Type HDI-100 - maximum wattage 1400
b. Type HDI-200 - maximum wattage 2800

The actual wattage may vary by plus or minus 5 percent from the rated wattage marked on the toaster when measured at rated voltage and the toaster heated to normal operating temperature (see 4.5.4).

3.6.3 Dielectric withstand voltage. Toasters shall withstand, without stress or damage, the dielectric test specified in 4.5.5.

3.6.4 Insulation resistance. The insulation resistance of the toaster measured as specified in 4.5.6 at normal operating temperature shall be not less than 2.0 megohms and at normal room temperature shall be not less than 4.0 megohms.

3.7 Exterior finish. The exterior finish of the toaster shall be such as to permit easy cleaning of the case. The finish shall be such that the case will not mar, discolor, or tarnish. The finish shall be in accordance with the applicable portions of NSF Standard No. 4 for this type of equipment.

3.8 Identification marking. Each toaster shall be marked with manufacturer's name, model number, contract number, date of manufacture, and the rating in volts and watts. The marking may be etched, engraved, or stamped directly on the back of the underside of the toaster, or the marking may be located on a metal identification plate, securely fastened to the back or underside of the toaster. Identification plates for shipboard toasters shall not be located on the underside of the toaster, but shall be in a location where plate information can be readily obtained. Identification plates shall have lettering that is etched, engraved, stamped, cast, or photoprocessed. The lettering on the plates shall be plainly visible, preferably black in color against a light background.

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

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

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

3.9 Stand. When specified (see 6.2), suitable stands rigidly constructed of corrosion-resisting steel structural sections shall be furnished to support multiples of two, three, or four type HDI-200 toasters in a compact space-saving manner.

3.10 Performance. Toasters shall have a performance life of not less than 65,000 cycles of operation during which period no parts shall fail nor shall the operating and timing devices bind (see 4.5.3). Toast shall be consistently uniformly browned. At the end of each cycle the toast shall rise automatically in class 1 toasters to such a position as to be readily accessible or drop into the receiving tray for class 2. Except where compensation for bread moisture is provided, the maximum and minimum toasting cycle time after a five-day warmup period shall not vary more than 5 percent from the average for a single cycle obtained from the test specified in 4.5.7. Minimum acceptable rate of toasting is 100 slices of "medium" brown toast per hour for the type HDI-100 toaster and 200 slices of "medium" brown toast per hour for the type HDI-200 toaster.

3.10.1 Toast color. Toast color describes the degree of doneness of fresh white bread toast and ranges from extreme light through medium to extreme dark. In "extreme light", the surface of the bread is unchanged in color. In "extreme dark", the surface of the bread is black due to carbonization. If

this color range is divided into nine shades of color, each equally discernible from the adjacent shade,"medium" would be identified as color number five, with extreme light being color number one and extreme dark color number nine. A similar procedure may be used to describe the toast color of other varieties of bread, such as enriched white, whole wheat, rye, and so forth.

3.11 Repair parts and tools.

3.11.1 General requirements. Each repair part shall be suitable for immediate use in replacing originally installed parts in any identical item of equipment, and the operation of the equipment in which such repair parts are installed shall be equal to that of the original equipment. In general, the design shall be such that no special tools are required; however, where the design and construction are such as to require the use of certain special tools for the proper maintenance, such tools shall be furnished.

3.11.2 Onboard repair parts furnished on a ship basis (shipboard applications). When onboard repair parts are consolidated and furnished on a ship basis, the quantities shall be based on the total number of toasters installed. Table I shall be used to determine the qualities of parts to be furnished.

TABLE I. Onboard repair parts

Part	Factor Code	Number of toasters installed per ship [1] 1	2	3	4	5-8	9-20	21-50	51-100
Heating elements (each size type)	R	0.20	0.40	0.60	0.60	0.80	1.50	3.00	3.50
Switches, complete with thermostats, if used	D	1	2	3	3	4	6	7	8
Timing mechanism, if used	H	1	1	1	1	1	2	3	4

TABLE I. Onboard repair parts - Continued

[1] For quantity of onboard repair parts required per ship, multiply the allowance factor in the applicable column by the quantity installed in one toaster and round the product to the nearest whole number.

Example: 0.10 = 1, 1.4 - 1, 1.5 = 2

3.11.3 Repair parts for stock equipment. Quantities as specified (see 6.2) shall be furnished with the equipment ordered for stock.

3.11.4 Repair parts for toasters for shore use. Quantities of repair parts as specified (see 6.2) shall be furnished with equipment ordered for shore use.

3.12 Instruction material. The manufacturer's standard commercial instructions and parts list shall be furnished with each toaster.

3.13 Workmanship. The toasters shall conform to the quality of product established by this specification, and the occurrence of defects shall not exceed the applicable acceptance quality levels.

4. QUALITY ASSURANCE PROVISIONS

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

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

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

a. First article inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

4.3 First article inspection. When a first article is required (see 3.1), it shall be examined for the defects in table II and tested as specified in 4.5. Tests may be extended by the contracting activity to cover the other type or other voltage ratings provided the basic design is identical. The presence of any defect shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with the inspection and testing procedures of this document. When applicable, definitions of quality assurance terms and procedures shall be in accordance with MIL-STD-105.

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

4.4.2 End item visual examination. The end item shall be examined for the defects listed in table II. The lot size shall consist of not more than 1,000 toasters of one type and capacity offered for delivery at one time. The sample unit shall be one toaster. The inspection level shall be III and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5.

TABLE II. End item visual defects

Examine	Defect
Finish	Does not permit easy cleaning of outer case
	Case becomes easily marred, discolored, or tarnished
Construction and workmanship	Metal parts not sufficiently sturdy for purpose
	Springs and unplated ferrous-metal screws or bolts used to carry current
	Plastic not suitable for use
	Parts not corrosion resistant
	Outer case not constructed of proper gage steel
	Vent openings located in back and sides of outer case

TABLE II. End item visual defects - Continued

Examine	Defect
Construction and workmanship - (continued)	Body not sufficiently reinforced Sheet-metal screws used in wrong locations, where disassembly is needed for servicing Special tools needed to replace parts Operating and timing mechanisms - not readily accessible - not replaceable as units - on type HDI-200, not separate mechanism for each 2 slices of bread
Toast carrier	Not of basket type or does not operate between guides Not suitably reinforced or of rigid construction
Crumb/receiving tray	Cannot be replaced without using tools Receiving tray not made of steel or durable high impact material as specified
Operating lever, adjustment knob	Not made of plastic
Supporting feet	Not made of plastic or hard rubber No metal inserts used in plastic feet for shipboard use For shipboard use, no specified means provided for securing
Switches	Do not break both sides of the line Not suitable for number of required cycles
Heating elements	Do not operate across line voltage Not easily removable for replacement Like elements not interchangeable Not fixed in position, easily disloged by shock or jar
Electrical connections	Type HDI-100 toasters include no cord and plug assembly Type HDI-200 toasters do not have terminal box Cannot operate at required voltage or wattage

TABLE II. End item visual defects - Continued

Examine	Defect
Stand	Not corrosion-resisting steel Not rigidly constructed
Data name plate	Omitted or not as specified Information incomplete or illegible Not located so as to be readily visible to operator

4.4.3 End item testing. The end item shall be tested for the characteristics listed in table III. The lot shall consist of not more than 1,000 toasters of one type and capacity offered for delivery at one time. A random sample of toasters shall be selected from each inspection lot. Each of the selected toasters shall be tested in accordance with table III, except that only one toaster from each inspection lot shall be subjected to the drop test and only three samples shall be subjected to the life test. Failure of any sample to pass the drop test shall be cause for rejection of the lot. Failure to conform to the requirements of any test except the drop test shall be considered a defect, and the toasters shall be rejected. If the number of nonconforming toasters in any sample exceeds the acceptance number for that sample, the lot shall be rejected.

TABLE III. End item tests

Characteristic	Document reference		Number of determinations per sample unit	Results reported as	Inspection level	AQL
	Requirement	Test method				
Operation	3.4	4.5.1	1	Pass or fail	I	1.0
Dropping	3.5	4.5.2	1	Pass or fail	-	-

TABLE III. End item tests - Continued

Characteristic	Document reference: Requirement	Document reference: Test method	Number of determinations per sample unit	Results reported as	Inspection level	AQL
Life	3.5.4	4.5.3	75,000 cycles	Number of cycles	-	-
Rating	3.6.2	4.5.4	1	Watts	I	1.0
Dielectric withstand voltage	3.6.3	4.5.5	1	Pass or fail	I	1.0
Insulation resistance (cold)	3.6.4	4.5.6.1	1	Pass or fail	III	2.5
Insulation resistance (hot)	3.6.4	4.5.6.2	1	Pass or fail	I	1.0
Toasting	3.10	4.5.7	1	Pass or fail	I	1.0

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

Examine	Defect
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

Examine	Defect
Materials	Any component missing, damaged, or not as specified
Workmanship	Inadequate application of components, such as incomplete sealing or closure of flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container
Quantity per shipping container	More or less than required

4.4.5 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1, and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

Examine	Defect
Finished dimensions	Length, width, or height exceeds specified maximum requirement
Palletization	Pallet pattern not as specified Interlocking of loads not s specified Load not bonded with required straps as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

4.4.6 Certification compliance examination. Certifications, certified test reports, or listing marks for codes and standards, as applicable, submitted in accordance with 3.2, shall be examined and validated as proof of compliance.

4.4.6.1 Underwriters Laboratories, Inc. (UL). Acceptable evidence of meeting the applicable requirements of the Underwriters' Laboratories standards specified in 3.2 shall be the UL label, a UL listing mark, or a certified test report from a recognized independent laboratory, acceptable to the Government, indicating that the toasters have been tested and conform to the applicable requirements of UL Standard No. 197.

4.4.6.2 National Sanitation Foundation (NSF). Acceptable evidence of meeting the applicable requirements of the National Sanitation Foundation standards specified in 3.2 shall be one of the following:

a. A listing in the current edition of the National Sanitation Foundation "Listing of Food Service Equipment", and display of the NSF seal on the finished unit.

b. A certification for the unit issued by NSF under their special one-time contract evaluation/certification service.

c. A certified test report acceptable to the contracting officer with the advice of the Army Surgeon General, from an independent testing laboratory, indicating that the unit has been tested and conforms to the specified NSF standards.

4.5 Methods of inspection.

4.5.1 Operation test. Determination shall be made that the heating elements are operating satisfactorily and that timing devices are in correct calibration. The pop-up/pop-down mechanism shall be checked to ascertain that it releases properly at normal operating temperatures.

4.5.2 Drop test. Following all other tests, the toaster shall be subjected to a drop test consisting of dropping from a 36-inch height to a steel surface while the toaster is in an upright position. No bending or breakage of internal parts shall occur during this test and the external controls shall be operative.

4.5.3 Life test. Three sample toasters shall be operated on a life cycle test for 75,000 cycles or until failure, whichever comes first. The life of the three samples shall average at least 65,000 cycles.

4.5.3.1 Cycle. A toasting cycle shall consist of a "power on" of approximately 60 seconds to obtain medium toast and a "power off" of 20 seconds to permit heater element to return to black heat.

4.5.3.2 Pop-up/pop-down. The toasters shall be automatically operated by a mechanism that depresses the lever or push button and then releases it so that the toaster carrier will pop up or down at a time dependent on the regular setting of the timing device. Pieces of bread substitute, the approximate weight of a piece of bread, shall be placed in the toast carrier to put a load on the return mechanism. The life tests shall be conducted with the center heater element disconnected in order to keep the operating temperature approximately normal. However, an external load equivalent to that of the disconnected element shall be connected in the circuit in order that the switch mechanism may be fully loaded.

4.5.3.3 Operating lever/push button. The automatic testing mechanism shall depress the toaster operating lever on class 1 toasters by means of a vertically travelling depressor arm. The depressor arm shall have provision for adding weights and its weight shall be adjusted to the minimum required to lower the toaster operating lever into toasting position. The operating lever shall be depressed by the free fall of the weighted depressor arm. The tip of the depressor arm shall be cushioned with 1/2 inch of sponge rubber. The depressor arm shall be adjusted so that in its raised position, the toaster operating lever just touches the rubber cushion. After the toaster operating lever has been depressed, the depressor arm shall be raised to its initial position so that there is no interference with the free return of the operating lever to its normal position at the end of the toasting cycle. For class 2 toasters, the automatic testing mechanism shall depress the button long enough to activate a cycle and then release. The speed of operation of the testing mechanism shall be adjustable within a range to meet the conditions of the test.

4.5.3.4 Automatic. For toasters in which the bread is lowered and raised automatically, the testing mechanism shall function to raise and lower substitutes for bread slices in a manner simulating normal operation at the rate specified in 4.5.3.1.

4.5.3.5 Contact resistance. Contact resistance of the switch shall be measured before and after the life test to determine conformance with 3.5.4.

4.5.4 Rating test. The toasters shall be operated at rated voltage and the actual electrical input measured to determine if the actual wattage is within plus or minus 5 percent of the rated wattage marked on the toaster, as specified in 3.6.2.

4.5.5 Dielectric withstand voltage test. The completely assembled toaster shall be subjected for a period of 1 minute to a dielectric voltage-withstand test at 900 volts 60 hertz alternating current applied between current-carrying parts and noncurrent-carrying parts. This test shall be made with the toaster switch closed and immediately following the operation of the

toaster at maximum operating temperatures. Maximum operating temperature for this test shall be that temperature attained during a preheat period consisting of five cycles of operation of the toaster allowing a 15-second interval following the time the toast carrier pops up or pops down and the beginning of the next cycle.

4.5.6 Insulation resistance. On type HDI-100 toasters, the insulation resistance shall be measured at the plug, between the grounding blade and the load blades. On type HDI-200 toasters, the insulation resistance shall be measured between the connection terminals and the frame. A potential of 250 volt dc or more shall be used. For the insulation resistance tests on the first article samples, the toaster shall be placed in an atmosphere having a relative humidity of not less than 90 percent at room temperature for 24 hours immediately prior to measuring insulation resistance.

4.5.6.1 Cold. The insulation resistance (cold) shall be measured with the toaster at normal room temperature.

4.5.6.2 Hot. The insulation resistance (hot) shall be measured immediately following operation of the toaster at maximum operating temperature.

4.5.7 Toasting test. The toasters shall be brought to normal toasting temperature, then fresh white sandwich bread, that is uniform in moisture content, texture, density, and formulation, prepared and baked in a commercial bakery, and stored in the original sealed wrappers for not less than 24 hours or more than 48 hours after baking, shall be inserted in the toasting chamber. The average time to obtain one cycle of medium toast shall be computed based on 25 toasting cycles. This average time for one cycle shall be the basis for determining the rate of output. The maximum and minimum toasting cycle time shall not vary more than 5 percent from the average, as specified in 3.10. The toast produced shall be inspected for quality and uniformity of color. Immediately following the 25 cycles of operation, the temperature of the operating handle shall be measured to determine compliance with 3.5.3.

5. PACKAGING

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

5.1.1 Level A.

5.1.1.1 Toasters. Toasters shall be individually preserved in accordance with method 1C-2 of MIL-P-116.

5.1.1.2 Stands. Each stand shall be disassembled, and each disassembled part shall be wrapped in a non-corrosive wrapping paper and unit packed in a snug-fitting fiberboard, grade W5 or W6 box conforming to PPP-B-636. Assembly hardware shall be placed in a cloth bag and secured to one of the disassembled parts prior to wrapping. Closure of boxes shall be in accordance with the appendix to PPP-B-636.

5.1.2 Commercial. Toasters or stands shall be individually preserved in accordance with ASTM D 3951.

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

5.2.1 Quantity. Quantity per shipping container shall be as follows:

Toaster, type HDI-100	4 per container
Toaster, type HDI-200	2 per container
Stand	10 per container

Toasters ordered with a stand (see 3.9) shall be packed with the stand in the same shipping container.

5.2.2 Level A packing. Toasters and stands, preserved as specified in 5.1 and in the quantity specified (see 5.2.1), shall be packed in containers conforming to any one of the specifications in table V at the option of the contractor. Fiberboard boxes shall be water proofed and reinforced by means of pressure-sensitive tape applied in accordance with the appendix to the box specification. Shipping container shall be closed, strapped, or banded in accordance with the applicable container specification or appendix thereto, except that metal straps shall not be used on fiberboard containers.

TABLE V. Level A packing containers

Specification	Container	Type or class
PPP-B-601	Wood, cleated plywood	Overseas type
PPP-B-621	Wood, nailed and lock corner	Class 2
PPP-B-636 [1]	Fiberboard	Weather-resistant
PPP-B-640 [2]	Fiberboard-corrugated triplewall	Class 2

TABLE V. Level A packing containers - Continued

[1] Army only - Not acceptable for level A packing as an exterior container unless V2s fiberboard is used, the weight is limited to 65 pounds, and the containers are palletized or utilized in accordance with MIL-STD-147 or packed in wood or wood cleated boxes specified herein.

[2] Army only - Not acceptable for level A packing.

5.2.3 Level B packing. Toasters and stands, preserved as specified in 5.1 and in the quantity specified (see 5.2.1), shall be packed in containers conforming to any one of the specifications listed in table VI. Containers shall be closed, strapped, or banded in accordance with the applicable container specification or appendix thereto.

TABLE VI. Level B packing containers

Specification	Container	Type or class
PPP-B-601	Wood, cleated plywood	Domestic type
PPP-B-621	Wood, nailed and lock corner	Class 1
PPP-B-636	Fiberboard	Domestic
PPP-B-640	Fiberboard-corrugated triplewall	Class 1

5.2.4 Commercial packing. Toasters and stands, preserved as specified in 5.1 and in the quantity specified (see 5.2.1), shall be packed in accordance with ASTM D 3951.

5.3 Repair parts and tools. Repair parts and tools shall be preserved, packed, and marked in accordance with MIL-E-17555 in the levels specified herein, except that first article testing is not required. Unless otherwise specified (see 6.2), the quantity per unit pack shall be one.

a. Onboard and shore use repair parts and tools shall be preserved level A and packed Commercial level.
b. Stock repair parts and tools shall be preserved level A and packed level B.

5.4 Palletization. When specified (see 6.2), toasters and stands, packed as specified in 5.2 (utilizing the fiberboard box specified in PPP-B-636), shall be palletized in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV or type V in accordance with MIL-STD-147. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means K and L or film bonding means O or P. The pallet pattern shall be in accordance with appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

5.5 Marking. Marking shall be in accordance with 5.5.1 and 5.5.2, as specified (see 6.2).

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

5.5.2 Military activities. In addition to any special marking specified in the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

6. NOTES

6.1 Intended use. The toasters are intended for military and Government dining facilities.

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. Class, type, and style required (see 1.2).
c. When a first article is required (see 3.1, 4.3, and 6.3).
d. Voltage required, and whether ac or dc (see 3.6.1).
e. Government approved manual number to be included on data name plate (see 3.8.1).
f. Stand for two, three, or four type HDI-200 toasters, if required (see 3.9).

g. Quantity of repair parts required with stock equipment (see 3.11.3).
h. Quantity of repair parts required for equipment for shore use (see 3.11.4).
i. Selection of applicable levels of preservation and packing (see 5.1 and 5.2)
j. When quantity per unit pack is other than specified (see 5.3).
k. When palletization is required (see 5.4).
l. Required marking (see 5.5).

6.3 First article inspection. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection as to those bidders offering a product which has been previously procured or tested by the Government, and that bidders offering such products who wish to rely on such production or test must furnish evidence with the bid that prior Government approval is presently appropriate for the pending procurement.

6.4 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification (see 3.3).

MILITARY INTERESTS:

Custodians:

Army - GL
Navy - SH
Air Force - 99

Review activities:

Army - MD, TS
Navy - YD
Air Force - 82
DLA - GS

User activity:

Navy - MC

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS
VA - DMS

Preparing activity:

Army - GL

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