

INCH-POUND

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SUPERSEDING

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## COMMERCIAL ITEM DESCRIPTION

## DOUGHNUT MACHINE, CUTTING AND FRYING (NAVAL SHIPBOARD)

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

## 1. SCOPE

This commercial item description (CID) covers electric, automatic cutting and frying doughnut machines for Naval shipboard use.

## 2. CLASSIFICATION

- Size 1: 40 dozen doughnuts per hour
- Size 2: 100 dozen doughnuts per hour
- Size 3: 200 dozen doughnuts per hour

## 3. SALIENT CHARACTERISTICS

3.1 Design and construction. The doughnut machine shall automatically cut and fry doughnuts. The doughnut machine shall consist of a dough hopper, a dough feeding and cutting device, a fat frying kettle with doughnut conveyor and turner, and a means of ejecting fried doughnuts. There shall be a bowl rest on top of the dough hopper for the size 3 machines. The heating zone of the machine shall be enclosed in a case, or at the option of the manufacturer the entire machine, except for the top of the fat frying kettle, shall be enclosed. There shall be a means to control the size and weight of the doughnuts; the range of adjustment shall be from not less than 12 to 18 ounces of dough weight per dozen doughnuts. There shall be a means to adjust the speed of the conveyor to provide various frying times. When specified, the size 2 and 3 machines shall be equipped with a glazer and an accumulating conveyor.

3.1.1 Glazer. The glazer shall automatically feed the product from the transfer rollover conveyor, cooling conveyor, or accumulating conveyor through the glazer and onto the cooling-packing conveyor or screen loader. The glazer shall be equipped with a variable speed pump drive system to control the volume of glaze flow. The unit shall easily disassemble for cleaning purposes. There shall be a means of controlling the speed of the conveyor to evenly distribute the glaze. The glazer shall either glaze the top and side of the product or enrobe it. The unit shall have an electrical connection that allows it to be energized by the doughnut machine.

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any other data which may improve this document should be sent to: Commander, Naval Sea Systems Command, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160.

AMSC N/A

FSC 7320

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3.1.2 Accumulating conveyor. The accumulating conveyor shall automatically transfer products from the fryer to auxiliary equipment and enable directional change of product flow. The accumulating conveyor shall be of modular design for adaptation in varied system configurations. The conveyor speed shall be adjustable to match fryer output. There shall be two sizes of accumulating conveyors; one to be used with the size 2 doughnut machine and one to be used with the size 3 doughnut machine. The unit shall plug into companion equipment. The unit shall have removable drip pans, sweep, and conveyor for cleaning purposes. The unit shall have an electrical connection that allows it to be energized by the doughnut machine.

3.2 Capacities. The hopper capacities and the cutting and frying capacities shall be as specified in table 1.

TABLE 1. Capacities

Size machine	Minimum hopper capacity (pounds of dry doughnut mix)	Minimum cutting and frying (dozen doughnuts per hour)
1	10	35
2	25	94
3	35	188

3.3 Stainless steel. Stainless steel shall be in accordance with ASTM A167, type 302 or 304.

3.4 Insulation. Insulation material shall have a K factor not greater than 0.57 Btu per hour per square foot per degree Fahrenheit per inch of thickness at 90 °F when packed to the density normally used in the doughnut machines.

3.5 Case. The case shall enclose the drive mechanism and heating zones, and they shall have openings with covers to allow access to all interior moving mechanisms. The cases and other exterior parts shall be constructed of stainless steel. Thickness of the case materials shall be not less than 0.0375 inch.

3.6 Leveling device. There shall be a leveling device attached to the bottom of the frame for leveling the machines.

3.7 Electrical requirements. The unit shall operate on 440 VAC, 60 Hz, three-phase power, as defined in DOD-STD-1399, Section 300, and shall have provisions for making direct (hardwired) connections for electric power (3 conductors) and for equipment grounding (1 conductor). All outermost metallic surfaces shall be grounded via the equipment grounding connection. The grounding resistance between any exposed metallic surfaces and the common ground point shall be not greater than 0.1 ohm. Electrical components, other than the hermetically sealed motor, shall be provided in accordance with NEMA 250, Type 13 or equivalent enclosure protection. Metal parts of electrical components and enclosures shall be constructed of stainless steel or shall be treated and processed for a stainless finish in accordance with IEEE Standard 45. (Shipboard requirement, see 7.2)

3.8 Shock hazard labels. A label reading "Danger - Shock Hazard" shall be affixed to the outer case assembly, on or adjacent to each service access cover near one of the fasteners securing the cover. In addition, a warning label in accordance with UL 969 shall be placed near the high voltage components inside the equipment. This label shall include, but not be limited to the following texts:

- Danger - Shock Hazard.
- Power supply must be disconnected before servicing.

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- Access covers must be in place before use.
- Service should be performed by authorized personnel only.

3.9 Frying kettle. The frying kettle shall be constructed of stainless steel. The kettle, except for the size 1 machine, shall have drains of the siphon or the hand-valve type, and shall have a means for automatically maintaining the frying fat level in the frying kettle by adding new fat from a reservoir of melted fat. The frying fat kettle may be insulated or noninsulated, in accordance with the manufacturer's standard practice.

3.10 Operating thermostat. Each doughnut machine shall have an adjustable thermostat mounted so as to be accessible to a machine operator standing at the feed position. The thermostat shall be marked in not greater than 50 °F increments and shall have a range of 200 to 400 °F; it shall limit the frying fat temperature to a level of not greater than 425 °F.

3.11 Overtemperature thermostat. The doughnut machine shall be provided with a second or overtemperature thermostat. The overtemperature thermostat shall be the nonadjustable, "negative bias", manual reset type. The overtemperature circuit shall be installed in the temperature control system, and shall shut off the entire electrical system when the fat reaches a temperature not greater than 430 °F. A fusible thermostatic cutoff is acceptable where temperature controls are electric. All heating circuit control devices shall be enclosed within the bodies of the devices or in separate enclosures forming parts of the bodies of the devices. In the event of hydraulic failure of the thermostat, the contacts shall close and activate the shunt trip coil of an external disconnect circuit breaker. The contacts of the upper temperature limit thermostat shall be connected to a separate terminal block within the fryer housing. (This secondary safety thermostat is for connection to the 115 VAC shunt trip coil of an external disconnect circuit breaker, when the doughnut machine is installed).

3.12 Primary thermostat shunt bypass assembly. The doughnut machine shall be provided with a primary thermostat shunt bypass assembly. The shunt bypass assembly shall consist of a normally open, momentary contact, oil tight, push-button type switch with a flush head, signal light, and wiring. Whenever the shunt bypass switch is pressed, the primary thermostat shunt bypass circuit shall be energized and the signal light shall glow; it shall deenergize whenever the shunt bypass switch is released.

3.12.1 Thermometer. Each doughnut machine shall be provided with a thermometer.

3.13 Heating elements. The fat heating elements shall have a total power capacity of not less than 4,200, 8,800, and 20,000 watts for the size 1, size 2, and size 3 machines, respectively. The machine shall have a light to indicate when the heating elements are in operation. The element shall be of the enclosed conduction type with resistance wire conforming to nominal composition of 80 percent nickel and 20 percent chromium; or 60 percent nickel, 16 percent chromium, and the remaining iron in accordance with ASTM B344, embedded in refractory material and enclosed in a tubular metal sheath of stainless steel. The terminals shall be insulated and shall be accessible for connection. The element shall be removable for cleaning purposes on the size 1 machine.

3.14 Repair and maintenance. There shall be provisions for adjustment, service, and replacement of electrical components, valves, and controls without disturbing or disassembling any major component on the machine. In

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addition, there shall be access to inspect, service, or adjust any component or equipment required for proper operation of the doughnut machine.

3.15 Finish. Stainless steel shall have a type 3 or smoother finish, in accordance with ASTM A480.

3.16 Inclined operation. The unit shall operate satisfactorily, in accordance with the requirements of this CID. There shall be no spillage of liquid or product when test operated for 30 seconds inclined at an angle of 15° (30° when specified for submarines) each side of the vertical, in each of two vertical planes at right angles to each other. (Shipboard requirement, see 7.2)

3.17 Environmental suitability. The unit shall be capable of withstanding ship's vibration and motion. Controls, switches, moving parts, and electrical circuits shall operate under shipboard conditions without malfunction, binding, excessive looseness, or damage, when tested in accordance with MIL-STD-167-1, type I equipment. The unit shall be secured to the test machine in the same manner that it will be secured on shipboard. (Shipboard requirement, see 7.2)

3.18 Physical size limitations. The unit shall pass or shall be provided with a means of disassembly so that it can pass through a shipboard access measuring 26 x 66 inches with 8-inch radius corners. When specified for submarines, the unit shall pass or disassemble so that it can pass through a 30-inch diameter submarine access. (Shipboard requirement, see 7.2)

3.19 Label plates. The unit shall be provided with a data nameplate and an instruction plate, both attached to the front of the unit. They shall be readily visible during normal operating use and shall not adversely affect the life and utility of the unit.

3.19.1 Data nameplate. The data nameplate shall contain the manufacturer's name, model, serial number, date manufactured, and any other information needed to uniquely identify the unit.

3.19.2 Instruction plate. The instruction plate shall provide instructions for start-up, operation, and shut-down.

3.20 Standards compliance. The unit shall be in accordance with and certified to meet the applicable requirements of NSF 4 and UL 197.

#### 4. REGULATORY REQUIREMENTS

The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation.

#### 5. QUALITY ASSURANCE PROVISIONS

5.1 Product conformance. The product provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market, or the same product that has been delivered to the Government for shipboard use on a previous procurement. The Government reserves the right to require proof of such compliance.

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## 6. PACKAGING

Preservation, packing, and marking shall be as specified in the contract or purchase order.

## 7. NOTES

7.1 Ordering data.

- Title, number, and date of this CID
- Size
- When required, manuals shall be in accordance with ASTM F760

7.2 Shipboard requirement. Whenever a "(Shipboard requirement)" is included in a paragraph under SALIENT CHARACTERISTICS, it is meant that the requirement is something that is not normally offered to the commercial market by the manufacturer.

7.3 Sources of documents.

7.3.1 Military documents. Copies of documents required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.

DOD-STD-1399 - Interface Standard for Shipboard Systems Section 300A  
Electric Power, Alternating

7.3.2 American Society for Testing and Materials (ASTM) Standards. ASTM Standards are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip  
ASTM B344 - Drawn or Rolled Nickel-Chromium and Nickel-Chromium-Iron Alloys for Electrical Heating Elements  
ASTM F760 - Food Service Equipment Manual

7.3.3 Underwriters Laboratories (UL) Standards. UL Standards are available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062.

UL 197 - Commercial Electrical Cooking Appliances

7.3.4 National Sanitation Foundation International (NSF) Standards. NSF Standards are available from the National Sanitation Foundation International, 3475 Plymouth Road, P.O. Box 130140, Ann Arbor, MI 48113-0140.

NSF 4 - Commercial Cooking, Rethermalization, and Powered Hot Food Holding and Transport Equipment

7.3.5 The Institute of Electrical and Electronic Engineers (IEEE) Standards. IEEE Standards are available from The Institute of Electrical and Electronic Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331.

IEEE 45 - IEEE Recommended Practice for Electric Installations on Shipboard

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7.3.6 National Electrical Manufacturers Association (NEMA) Standards. NEMA Standards are available from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

NEMA MG 1 - Motors and Generators  
NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)

7.4 Suggested sources of supply. One manufacturer known to meet the requirements of this CID is listed below. However, source of supply is not limited to this company, if others are found to meet the requirements of this CID.

Belshaw Brothers Inc.  
1750 22nd Avenue South  
Seattle, WA 98144

MILITARY INTERESTS:

Custodian:  
Navy - SH

CIVIL AGENCY COORDINATING ACTIVITIES:  
GSA - FSS

Preparing activity:  
Navy - SH  
(Project 7320-0963)