

INCH-POUND

A-A-59463

17 April 2000

SUPERSEDING

MIL-F-80079C

6 August 1990

COMMERCIAL ITEM DESCRIPTION

FURNACE, HEAT TREATING, ELECTRIC CONTROLLED ATMOSPHERE, HORIZONTAL BOX DESIGN

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

1. **SCOPE.** This commercial item description (CID) establishes the government acquisition requirements for heat-treating furnaces utilizing an electrically controlled and manufactured atmosphere. These furnaces will be used in metallurgical processes such as hardening, tempering, normalizing, and annealing metal parts.

2. **CLASSIFICATION.** The furnaces operating temperature range shall be of the following classes. The class of furnace to be supplied shall be as specified (see 7.5(b)).

2.1 Classes.

Class 1 - 1400 to 2000 °F

Class 2 - 1600 to 2500 °F

Class 3 - 2000 to 2750 °F

3. **SALIENT CHARACTERISTICS.** The furnaces shall meet the requirements of Instrument Society of America (ISA) MC96.1, "Temperature Measurement Thermocouples", National Electrical Manufacturers Association (NEMA) ICS-1, "Industrial Control and Systems General Requirements" (DoD adopted), and National Fire Protection Association (NFPA) 79, "Electrical Standard for Industrial Machinery" (DoD adopted).

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: Defense Supply Center Richmond (DSCR), ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.

AMSC N/A

FSC 3424

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

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3.1 Components. The furnace shall have a horizontal box design with a frame, shell, hearth, refractory, door, flame curtain, heating elements, atmosphere control system, instruments and operating controls.

3.2 Thermocouples. The thermocouples shall meet the requirements of ANSI C96.1.

3.3 Instruments. The instruments shall meet the requirements of NEMA ICS-1.

3.4 Controls. The furnace shall include mechanical, hydraulic, or pneumatic operating controls designed and positioned for convenient use from an operator workstation.

3.5 Performance. The furnace shall be capable of continuous operation at any temperature within its specified operating range, with loads up to 100 pounds per square foot of hearth area.

3.5.1 Heating Rate. The Class 1 furnace shall be capable of heating a charge of low carbon steel equivalent to not less than 40 pounds per square foot of hearth area from 70 °F to maximum temperature in one hour. Class 2 and Class 3 furnaces shall be capable of heating an equivalent charge to 2200 °F in one hour.

3.5.2 Temperature Uniformity. With the furnace charged and the temperature stabilized, the temperature at any point in the effective working zone shall not vary more than plus or minus 25 °F from the instrument control point. Each furnace shall be capable of maintaining the temperature uniformity specified with any size charge up to maximum load and at any desired temperature within its operating range.

3.6 Power Supply. The furnace shall operate from a single-source primary electrical power supply with a step-down transformer to supply a 120-Vac atmosphere control system.

3.7 Shell. The shell shall be a gas tight construction. The front of the furnace surrounding the door opening shall be designed and constructed of such material that warpage will be prevented.

3.8 Refractory. The lining shall be constructed of suitable material to minimize atmosphere contamination. The outside surface temperature of the furnace shall not exceed ambient air temperature as follows:

- a. Class 1 furnace shall not exceed 100 °F
- b. Class 2 furnace shall not exceed 150 °F
- c. Class 3 furnace shall not exceed 200 °F

3.9 Door. The door shall open or close in not more than 10 seconds during operation.

3.10 Flame Curtain. Unless otherwise specified (see 7.5(c)), a gas-air-flame curtain shall be provided for the door openings and shall operate automatically to protect the furnace atmosphere when the door is open.

3.11 Program Control. When required, the furnace shall be provided with a program control system integrated with the instrument controls. Programming requirements such as heating rates, cooling rates and soak periods shall be as specified (see 7.5(d)).

3.12 Instruments. Each furnace shall be provided with a single self-contained temperature indicating-recording-controller type instrument with an accuracy of 0.25 percent or better of full scale reading. The instrument shall be marked to indicate the particular type of thermocouple for which it is calibrated. Automatic reference junction compensation shall be provided in all instruments using thermocouples as a primary temperature sensing element.

3.12.1 Temperature Recorder. The temperature recorder shall be as specified in the acquisition contract or order (see 7.5(e)).

3.12.2 Temperature Controller. Unless otherwise specified, the temperature controller shall be a time proportioning type control and shall operate a contactor through an intermediate relay system. When required, the controller shall be a current digital proportioning type and a silicon controlled rectifier as specified in the acquisition contract or order (see 7.5(f)). The system furnished shall have the necessary adjustments to be capable of maintaining the set control temperature within 2 °F and provide a thermocouple upscale failsafe protection that will shut off the heat source when the temperature exceeds approximately 100 °F above the maximum.

3.12.3 Temperature Indicator. The calibrated scale range shall not be less than 100 °F above the maximum temperature of the furnace with the increments between successive temperature marks not greater than 20 °F and the spacing of numbered marks not greater than 400 °F. The control indicator shall be provided with two pointers, one pointer shall be adjustable to the desired control temperature and the other pointer shall indicate the actual furnace temperature.

3.12.4 Excess Temperature Control. The furnace shall be provided with an excess temperature control circuit independent of the operating control circuitry. The controller shall provide for selecting the over-temperature control point and shall function to shut off the heat source to the furnace when the over-temperature control point is reached sounding an audible alarm. The furnace shall remain off until started manually. Calibrated accuracy shall be within one percent of full scale reading.

3.13 Size and Capacity. The furnace size and capacity shall be as specified in the acquisition contract or order (see 7.5(g)).

3.14 Materials. Materials which are exposed to the internal environment of the furnace chamber shall be compatible with the atmosphere and temperature conditions specified for the furnace.

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3.15 Nameplate. A permanent nameplate shall be attached to the furnace. Unless otherwise specified in the acquisition order (see 7.5(h)), the nameplate shall display the following information:

- a. Nomenclature and classification
- b. Manufacturer's name
- c. Manufacturer's model designation
- d. Manufacturer's serial number
- e. Power input (voltage, total current, phase, frequency)
- f. Current rating of largest motor
- g. Short circuit/over-current protection rating
- h. National stock number
- i. Contract or order number (if specified)
- j. Date of manufacture (if specified)

3.16 Standard Equipment. All standard equipment normally provided with the manufacturer's commercial machine shall be furnished.

3.17 Optional Equipment. Optional equipment shall be furnished as specified and fully described in the acquisition contractor order (see 7.5(i)). The optional equipment provided shall be functional without requiring modification of the equipment or machine.

4. REGULATORY REQUIREMENTS

4.1 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 (FAR).

5. PRODUCT CONFORMANCE PROVISIONS

5.1 Product conformance. The products provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and shall be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

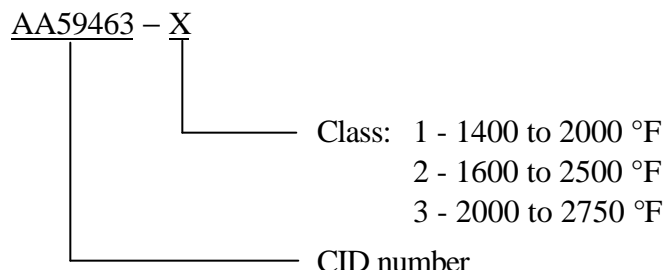
5.2 Market acceptability. The product offered must have been previously sold either to the government or on the commercial market.

6. PACKAGING

6.1 Preservation, packing, and marking. For acquisition purposes, the furnaces supplied shall be preserved, packed, and marked as specified in the acquisition order (see 7.5(j)).

7. NOTES

7.1 Part or identification number (PIN). The following part or identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.



7.2 Sources of documents.

7.2.1 FAR. The FAR may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.

7.2.2 ANSI standards. Copies of ANSI standards may be obtained from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.

7.2.3 NEMA standards. Copies of NEMA standards may be obtained from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

7.2.4 NFPA standards. Copies of NFPA standards may be obtained from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269-9101.

7.3 National stock number (NSN). The NSN 3424-01-441-9241 is associated with the furnace described in this document. Other NSNs may also correspond to this document.

7.4 Sources of supply. The manufacturers and/or suppliers listed below are known to supply products which meet the salient characteristics requirements of this document. Competition is not limited to the listed firms.

Lucifer Furnaces, Inc.
2048 Bunnell Road
Warrington, PA 18976
Phone: (215) 343-0411
FAX: (215) 343-7388
E-mail: www.luciferfurnaces.com

Thermcraft, Inc.
P.O. Box 12037
3950 Overdale Road
Winston-Salem, NC 27117
Phone: (336) 784-4800
FAX: (336) 784-0634
E-mail: www.thermcraftinc.com

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7.5 Ordering data. Acquisition documents must specify the following information:

- a. Title, number, and date of this document
- b. Class required (see 2.1)
- c. Flame curtain, if different (see 3.10)
- d. Program control, when required (see 3.11)
- e. Temperature recorder (see 3.12.1)
- f. Temperature controller, if different (see 3.12.2)
- g. Size and capacity (see 3.13)
- h. Nameplate, if different (see 3.15)
- i. Optional equipment (see 3.17)
- j. Packaging requirements (see 6.1)

MILITARY INTERESTS:

Custodians:

Army - AL

Navy - SH

Air Force - 99

Reviewers:

Army - AV

Navy - MC, OS

Air Force - 84

**CIVIL AGENCY
COORDINATING ACTIVITY:**

GSA - 6FET

Preparing activity:

DLA - GS

(Project 3424-0158)