

[INCH-POUND]
OO-B-2925
May 16, 1997
SUPERSEDING
MIL-B-28685
9 August 1990

FEDERAL SPECIFICATION

BAGHOUSE, REVERSE PULSE JET; FOR PACKAGED BOILERS FIRED ON COAL OR A COMBINATION OF COAL AND GAS, COAL AND OIL, OR COAL-GAS-OIL (2,000,000 TO 125,000,000 BTU/HR THERMAL OUTPUT CAPACITY)

The General Services Administration has authorized the use of this specification by all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers reverse pulse jet baghouses, with induced draft fan, installed on packaged boilers fired by coal, coal and gas, coal and oil, or a combination of coal, oil and gas. This specification covers only one classification of baghouse.

2. APPLICABLE DOCUMENTS

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

Military Standard

MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 15E2), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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(Copies federal and military specifications and standards required by contractors in connection with specific procurement functions are obtained from Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.1 Other Government documents and publications. The following other Government documents and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DEPARTMENT OF LABOR (DoL) OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR, Part 1910 Occupational Safety and Health Standards.

(Application for copies of DoL standards should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.)

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

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)

AMCA - Publication 203 - Field Performance Measurement.

(Private sector and civil agencies may purchase copies of these voluntary standards from the Air Movement and Control Association, 30 W. University Drive, Arlington Heights, IL 60004.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 1 - General Standards for Industrial Controls and Systems.
NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies.
NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
NEMA MG 1 - Standards for Motors and Generators.

(Private sector and civil agencies may purchase copies of these voluntary standards from the National Electrical Manufacturers Association, 2101 L Street, N.W., Washington, DC 20037.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 - National Electrical Code.

(Private sector and civil agencies may purchase copies of these voluntary standards from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.)

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(DoD activities may obtain copies of those adopted voluntary standards listed in the DoD Index of Specifications and Standards free of charge from the Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The baghouse shall use the reverse pulse jet method of bag cleaning. The baghouse shall be furnished with an induced draft fan, ductwork, and controls. The baghouse shall capture particulate emissions from a coal fired boiler as required to allow the boiler to operate in compliance with all governing environmental regulations.

3.2 Standards. The baghouse structural work shall be in compliance with the OSHA standards of 29 CFR, Part 1910.

3.3 Standard commercial product. The baghouse shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in baghouse being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

3.5 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

3.6 System of measurement. The dimensions used in this specification are not intended to preclude the use of the metric system of measurement in the fabrication and production of the

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material, individual parts, and finished product, provided form, fit, and function requirements are satisfied.

3.7 Design. The baghouse shall be designed in accordance with the manufacturer's standard design and the additional requirements specified herein. The baghouse shall be designed for the gas temperatures, dust concentration, gas composition, and dust physical properties typical of this application. The baghouse shall be designed to have a minimum of four individually operated modules. Draft shall be provided by an induced draft fan provided with the baghouse. The bags shall be cleaned with a fully automated reverse pulse air system. The baghouse shall be designed for the following operating parameters as specified (see 6.2).

- a. Maximum gas flow in cubic feet per minute (ft^3/min) (cubic metre per second (m^3/s)).
- b. Minimum gas flow (ft^3/min) (m^3/s).
- c. Location of installation site.
- d. Elevation of installation site in feet (metre (m)) above sea level.
- e. Earthquake construction zoning required at the installation site.
- f. Required draft at boiler flue gas outlet, in inches of water (pascals (Pa)), at maximum gas flow conditions.
- g. Reverse pulse air pressure available in pound per square inch gage (psig) (kilopascals gage (kPa (gage))).
- h. Volume of reverse pulse air available (ft^3/min) (m^3/s).
- i. Maximum, minimum, and average anticipated ambient air temperatures degrees Fahrenheit ($^{\circ}\text{F}$) (degrees Celsius ($^{\circ}\text{C}$)).

3.7.1 Pressure drop. Unless otherwise specified (see 6.2), the pressure drop from the induced fan suction to the boiler flue gas outlet shall be not greater than 8.0-inches of water column (1 990.7 Pa). Pressure drop shall be when operated at maximum gas velocity rates (see 3.7.2) with one module off line.

3.7.2 Baghouse gas velocity. Unless otherwise specified (see 6.2), the ratio of gas volume in cubic feet per minute (ft^3/min (m^3/s)) to baghouse area in square feet (square metre (m^2)) shall be not greater than 5.0 feet per minute (1.5 metre per minute) with one module off line.

3.7.3 Induced draft fan design. The induced draft fan shall be designed to handle 120 percent of the maximum specified volume specified in 3.7. This shall be accomplished while generating a draft equal to 125 percent of the sum of the required draft at the boiler outlet and the pressure drop of 3.7.1.

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3.8 Performance.

3.8.1 Particulate emissions. The baghouse shall meet the particulate emission standards required by the governing environmental agency(s) at the installation site as specified (see 6.2). Particulate emissions shall be measured using the test procedure required by the governing environmental regulatory agency as specified (see 6.2). The emissions shall be in compliance under all boiler operating conditions unless otherwise exempted by the regulations of the governing environmental regulatory agency(s). These compliance exemptions shall be as specified (see 6.2).

3.8.2 Induced draft. The induced draft fan shall produce the specified draft at the boiler flue gas outlet when the boiler is producing the maximum flue gas volume and one baghouse module is off line. Performance testing shall be as specified in 4.4.1.

3.9 Construction. The baghouse shall be constructed for the design requirements (see 3.7), performance requirements (see 3.8), and the additional requirements specified herein.

3.9.1 Foundations. Unless otherwise specified (see 6.2), baghouses too large to be shipped assembled to the installation site shall be provided with the concrete foundations for the baghouse, fan, and ductwork supports when the baghouse is to be constructed at the installation site.

3.9.2 Structural. All necessary structural supports shall be provided, including fabricated skid and support bases, access platforms, ladders, and stairs. Structural supports shall be built to satisfy the specified earthquake construction zone requirements (see 3.7). Access platforms, ladders, and stairs shall be constructed in accordance with 29 CFR, Part 1910. Support steel shall be built to withstand the thermal expansions forces occurring during extended operation of the baghouse under maximum boiler firing conditions. The housing shall be capable of withstanding the negative internal pressure existing during operation.

3.9.3 Insulation. Baghouse and supplied ductwork shall be sufficiently insulated to maintain internal wall temperatures above the flue gas dewpoint temperature during all load conditions. Insulation material shall be nonasbestos. Insulation shall be held in place with insulation lugs spaced on not greater than 12-inch by 18-inch (304.8 by 457.2 mm) centers. The outside wall surface temperature shall be not greater than 60 °F (15.56 °C) above ambient air temperature when baghouse is operating at maximum capacity. Hot spot sources such as access doors, pressure taps and observation ports shall be fully insulated. The baghouse insulation shall be jacketed with aluminum lagging with a thickness of not less than 0.020-inch (24 U.S. Standard Gage) (0.508 mm)). The color of the lagging shall be as specified (see 6.2).

3.9.4 Ductwork. When specified (see 6.2), ductwork shall be furnished with the baghouse. Ductwork shall be insulated as specified in 3.9.3.

3.9.4.1 Ductwork routing. Unless otherwise specified (see 6.2), ductwork shall be provided from the baghouse to the boiler transition piece, from the baghouse to the fan inlet, and from the fan outlet to the stack transition piece. A bypass duct with an automatic damper shall also be furnished to allow flue gas to bypass the baghouse. Dimensions of the boiler and stack transition

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pieces shall be as specified (see 6.2). Boiler plant layout dimensions and relative locations of the boiler and stack transition pieces shall be as specified (see 6.2). Ductwork shall be field welded with no gasketed joints. Low points in the ductwork shall be fitted with a threaded plug drain of not less than 1.0-inch (25.4 mm) in size.

3.9.5 Access. Adequate access shall be provided that allows ease of bag replacement and performance of other routine maintenance. A lockout system shall be provided that prevents entry into the baghouse while the unit is operating. The lockout system will be such that the baghouse cannot be operated unless all access doors are locked in the closed position.

3.9.6 Hopper. The hopper walls shall have a slope of not less than 60 degrees to prevent bridging of the collected material during dumping operations. Unless otherwise specified (see 6.2), the bottom of the hopper shall be not less than 5.0 feet (1.52 m) above grade. A hopper material level indicator shall be furnished with each hopper. The hopper flue gas inlet shall have a damper valve to isolate the module during dumping operations. Hopper heating, dumping, and vibrating systems shall be as specified in 3.9.6.1 through 3.9.6.3.

3.9.6.1 Hopper heating system. Hoppers shall be heat traced to prevent condensation of flue gas moisture. Heaters, except hopper throat heaters, shall be of low-watt density, multiple resistance path, modular design. Watt densities for the modules shall be not greater than 3 watts per square inch (4 650 watt per square metre (w/m^2)). The heaters and insulation shall be adequate to maintain a hopper wall temperature of not less than 280 °F (138 °C) at all times. Hopper throat heaters shall be flexible, electric blankets or tapes rated at not less than 800 °F (427 °C). Temperature indicators shall be provided to confirm the operation of the heating system. A manually adjustable setpoint control shall be furnished with the heating system.

3.9.6.2 Hopper dumping system. Material shall be removed from the hopper with the dumping system. The system shall include either a manual slide valve, trickle or double tipping valve, rotary valve, or screw conveyor as specified (see 6.2). When a manual slide valve is provided, it shall be furnished with high temperature gaskets and easy opening and securing devices. When a trickle or double tipping valve is provided, it shall be furnished with gas tight seals and an adjustable speed motorized operator. When a screw conveyor is provided, it shall be furnished with the means to convey material from the bottom of each hopper to a common material collection area.

3.9.6.3 Hopper vibrating system. When specified (see 6.2), a variable speed vibrating device shall be furnished and installed on each hopper. This device shall be able to mechanically agitate the hopper side walls during dumping operations to prevent material bridging within the hopper. The device shall either be pneumatically or electrically operated as specified (see 6.2). The device shall be either manual or automatic controlled as specified (see 6.2).

3.9.7 Bags. Bags shall be of fiberglass material able to withstand extended service at temperatures of not less than 500 °F (260 °C). The bags shall be treated with a silicone based or similar lubricant to minimize abrasive wear between the individual yarns of the bag. Bag diameter

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shall be ranged from 4.5 to 6.0-inches (114.3 to 152.4 mm) in diameter. Bag length shall be ranged from 12 to 16 feet (3.65 to 4.88 m). The spacing between bags shall be not less than 2.0-inches (50.8 mm). The bag cleaning system shall only use pulsed air and venturi tubes or diffusers. The bag cleaning system shall not include traveling rings or sonic horns.

3.9.8 Fan. Each fan shall be a heavy duty radial tip, straight radial, or backward inclined blade design. The fan shall be operated from a direct drive coupled electric motor with a speed not greater than 1200 revolutions per minute. The rotor shall be overhung on two bearings. The inlet and outlet shall be flanged. Access doors shall be provided on the inlet box and outlet. Access doors shall be accessible through insulation by either having the doors raised above the fan housing surface or by having easily removed insulation covers. Additional fan requirements are specified in 3.9.8.1 through 3.9.8.3.

3.9.8.1 Fan housing. The fan housing shall be of welded steel construction and furnished with lifting lugs. The damper shall be furnished with a damper operator as specified in 3.10.4. The housing shall be split to allow for removal of the rotating assembly without removal of ductwork. Threaded plug drain connections shall be provided on the inlet and outlet side housing low points of not less than 1.0-inch (25.4 mm) in size.

3.9.8.2 Fan rotor, bearings, and coupling. Rotor blade thickness shall be not less than 0.25-inch (6.4 mm) with an additional 0.25-inch (6.4 mm) of wear pad. The rotor shall be statically and dynamically balanced before shipment and shall be of all welded construction. Shaft critical speed shall be not less than 125 percent of motor speed. Bearings shall be roller antifriction style with grease lubrication. The coupling shall be furnished with an OSHA approved coupling guard.

3.9.8.3 Damper. The fan shall be furnished with a multi-louver parallel blade inlet box damper. The damper shall be furnished with a damper operator.

3.9.9 Explosion vents. Each module shall be furnished with explosion vents to provide rapid relief of internal pressure. The vents shall be hinged and may be side or roof mounted. The area of the vent in square feet shall be not less than 10 percent of the volume of the module in cubic feet.

3.10 Controls. The baghouse controls shall consist of the reverse pulse bag cleaning, safety hopper dump, and boiler draft control system specified below. A programmable controller shall be used to coordinate the operation of the systems. The control panel shall display the sequences as specified in 3.10.1 through 3.10.5.

3.10.1 Reverse pulse bag cleaning system. The bag cleaning system shall be capable of operating automatically on either a differential pressure switch or a timed cycle. Both control systems shall be provided with manually adjustable setpoints. A common inlet and individual module outlet manometers shall indicate the differential pressure across each module. During cleaning operations, the control panel display shall simultaneously indicate the module being cleaned and the status of the cleaning cycle. Only one module shall be capable of being cleaned at one time.

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3.10.2 Safety systems. The baghouse shall be fitted with a fire protection and a high differential pressure shutdown safety system.

3.10.2.1 Fire protection system. A thermal detector shall be provided on the outlet gas stream from each module. The detector will monitor the outlet temperature and initiate an alarm when the temperature rise indicates a fire in the module. The alarm shall trigger the module damper valves to close and remain closed until manually reset to open. The alarm signal shall be sent to the control panel.

3.10.2.2 High differential pressure system. The differential pressure across each baghouse shall be monitored and compared to a common adjustable setpoint controller. Differential pressures exceeding the setpoint value shall initiate an alarm sequence that shall bypass the module with the high differential pressure by closing the module automatic dampers. Activation of additional high differential pressure alarms causing more than 30 percent of total bag surface area to be off line shall activate the main baghouse bypass damper.

3.10.3 Hopper dump system. The hopper dump system controls shall include the controls required in 3.9.6. The control panel shall indicate the hopper material level and module damper position. Panel mounted or local instrumentation shall be used to indicate the hopper wall temperatures and the temperature set point of the heat tracing temperature controller.

3.10.4 Boiler draft system. A controller shall be furnished on the induced draft fan inlet damper to maintain the setpoint draft on the boiler flue gas outlet. The draft controller shall monitor the draft close to the boiler flue gas outlet and adjust the inlet damper accordingly to maintain the required draft. The controller shall have an adjustable setpoint. The controller shall be compatible in both type and make with the existing boiler control system.

3.10.5 Control panel. The controls for the baghouse including operating switches, indicating lights, gages, alarms, motor starters, circuit breakers, and programmable controller shall be mounted on a single control panel or cabinet insofar as practicable in order to centralize the baghouse control functions. The common alarm indicator shall consist of a panel mounted light. When specified (see 6.2), the alarm signal shall also activate an audible alarm. The control panel shall be located on the packaged assembly.

3.11 Electrical requirements. Electrical wiring design practices shall be in accordance with the applicable requirements of NFPA 70. The baghouse and associated equipment shall obtain power from a circuit with a single master manual service disconnect switch and automatic circuit breaker for all electrical equipment. Motors shall be in accordance with the provisions of NEMA MG 1, shall be totally enclosed fan cooled, and designed for operation on the voltage, phase, and frequency as specified (see 6.2). Unless otherwise specified (see 6.2), motors of 100 horsepower (74 600 W) and less shall be provided with magnetic across-the-line starter and overload protection. Motors over 100 horsepower (74 600 W) shall have reduced voltage starting. Motor starters shall conform to the applicable requirements of NEMA ICS 1 and ICS 2. Motor starters and controls shall be enclosed in NEMA ICS 6 type 12 enclosures and may be installed in the control panel of 3.10.5.

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3.12 Cleaning, treatment, and painting. Bare steel surfaces shall be cleaned and a primer coat applied. Paint shall be applied to normally painted surfaces in good commercial practice.

3.13 Lifting and tiedown attachments. When specified (see 6.2), the baghouse shall be equipped with lifting and tiedown attachments. Lifting and tiedown attachments shall conform to type II or type III of MIL-STD-209. A nonferrous transportation plate shall be provided and mechanically attached to the baghouse. Transportation plates shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tiedown attachments may be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tie down of the baghouse on the carrier when shipped.

3.14 Mounted operating instructions. Unless otherwise specified (see 6.2), operating instructions shall be summarized on a decal or corrosion resistant plate to be mounted inside the control panel door or similar weatherproofed location.

3.15 Identification marking. Identification shall be permanently and legibly marked directly on the baghouse or on a corrosion-resistant metal plate. Identification shall include manufacturer's name, baghouse model and serial number, capacity and year of manufacture. The Department of Defense contract number that this equipment is procured under shall also be marked on the equipment or identification plate.

3.16 Spare parts. When specified (see 6.2), spare parts shall be furnished with the baghouse. When furnished, the spare parts required, the description and the quantity of spare parts to be furnished shall be as specified (see 6.2).

3.17 Factory start-up service. Unless otherwise specified (6.2), factory authorized service personnel shall be provided to supervise installation and start-up of the packaged unit for five 8-hour working days.

3.18 Workmanship. Workmanship shall be of such quality as to produce baghouses meeting the requirements of this specification and standards prevailing among manufacturers normally producing this type of equipment.

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 (examinations and test) 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 ensure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items shall 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 this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

- a. Quality conformance inspection (see 4.2.1).
- b. On-site inspection (see 4.2.2).

4.2.1 Quality conformance inspection. This shall be performed at the manufacturer's facilities. Unless otherwise specified (see 6.2), the quality conformance inspection shall include the examination of 4.3.

4.2.2 On-site inspection. The on-site inspection shall be in addition to the quality conformance inspection performed at the manufacturer's facilities. Unless otherwise specified (see 6.2), the on-site inspection shall consist of the tests of 4.6.

4.3 Examination. Each baghouse supplied shall be examined for compliance with the requirements specified in section 3 of this document. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4 On-site tests. Operational tests shall be performed on each installed baghouse. These tests shall be in addition to any manufacturer's standard test procedure, unless compliance evidence provided by the baghouse manufacturer is accepted at the discretion of the contracting officer or authorized representative. Acceptable test results from identical or similar equipment installed at the same site may also be used at the discretion of the contracting officer as proof that equipment procured with this specification is in compliance with one or more of the tests of 4.4.1 through 4.4.4.

4.4.1 Induced draft fan. The induced draft fan shall be tested in accordance with the AMCA Publication 203 to ensure draft and air flow requirements of 3.8.2 are satisfied.

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4.4.2 Controls. Each control and safety requirement shall be confirmed to be operational and functioning in accordance with the requirements of 3.10.

4.4.3 Equipment tests. Control panels, insulation, valves, controllers, regulators, electric motors, dampers, and other related equipment shall be operated as part of the equipment tests. The operation of this equipment shall be closely observed during the operational tests for possible defects or nonconformance. The action of dampers, actuators, and valves shall be smooth without backlash.

4.4.4 Emissions test. The required emissions testing for particulates shall be conducted in accordance with the procedures of the governing federal, state, or local environmental agency as specified in 3.8.1.

5. PACKAGING

5.1 Packaging requirements. The preservation, packing, and marking shall be as specified by the contract or order.

6. NOTES

(This section contains information of general or explanatory nature that may be helpful, but not mandatory.)

6.1 Intended use. The baghouse is intended for removal of particulate emissions from the flue gas of coal fired boilers on land installations.

6.1.1 Section factors. The following should be considered in the selection of a baghouse:

Fungus resistant varnish conforming to MIL-V-173 should be used to coat electrical components and circuit elements, including terminal and circuit connections, when the baghouse is to be installed in humid conditions. Components and elements inherently inert to fungi or in hermetically sealed enclosures or current-carrying contact surfaces should not be coated.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Required operating design parameters for the following (see 3.7):
 - (1) Maximum gas flow in ft^3/min (m^3/s).
 - (2) Minimum gas flow in ft^3/min (m^3/s).
 - (3) Location of installation site.
 - (4) Elevation of installation site in feet (m) above sea level.
 - (5) Earthquake construction zoning requirements at the installation site.
 - (6) Required draft at boiler flue gas outlet, in inches-of water (Pa), at the maximum gas flow conditions.

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- (7) Reverse pulse air pressure available in psig (kPa (gage)).
- (8) Volume of reverse pulse air in ft³/min (m³/s).
- c. Pressure drop from the induced fan suction to the boiler flue gas outlet, if other than 8.0 inches (1 990.7 Pa) of water (see 3.7.1).
- d. Baghouse gas velocity, if other than as specified (see 3.7.2).
- e. Applicable particulate emission standards and governing environmental regulatory agency(s) at the installation site (see 3.8.1).
- f. Applicable test procedure of the governing environmental agency(s) at the installation site for particulate emissions measurement (see 3.8.1).
- g. Compliance exemptions of the governing environmental agency(s) at the installation site for boiler operating conditions (see 3.8.1).
- h. When concrete foundations are not to be provided with baghouse (see 3.9.1)
- i. Color of lagging (see 3.9.3).
- j. When ductwork is to be provided with baghouse (see 3.9.4).
- k. Ductwork routing, if other than as specified (see 3.9.4.1).
- l. Dimensions of boiler and stack transition pieces (see 3.9.4.1).
- m. Boiler plant layout dimensions and relative location of the boiler and stack transition pieces (see 3.9.4.1).
- n. When bottom of hopper is to be more than 5.0 feet (1.52 m) above grade (see 3.9.6).
- o. Type of hopper dumping system required (manual slide valve, trickle or double tipping valve, rotary valve, or screw conveyor) (see 3.9.6.2).
- p. When a variable speed vibrating device is to be furnished and installed on the hopper, and, if furnished, whether the vibrating device is to be pneumatically or electrically operated and either manual or automatic controlled (see 3.9.6.3).
- q. When the alarm signal is to activate an audible alarm (see 3.10.5).
- r. Power, voltage, phase, and frequency for which motors are to be designed (see 3.11).
- s. When motors of 100 horsepower (74 600 W) and less are not to be provided with magnetic starter and overload protection (see 3.11).
- t. When lifting and tiedown attachments are required (see 3.13).
- u. When operating instructions are to be other than as specified (see 3.14).
- v. When spare parts are required, and, if required, the description and quantity (see 3.16).
- w. Use of factory service personnel, if other than as specified (see 3.17).
- x. Quality conformance inspection, if other than as specified (see 4.2.1).
- y. Onsite inspection, if other than as specified (see 4.2.2).

6.3 Compliance. Prior to approval of shipment, the contractor should submit to the contracting officer or authorized representative satisfactory evidence that the proposed baghouse to be furnished under this specification meets the applicable requirements 29 CFR, Part 1910.

6.3.1 OSHA requirements. Acceptable evidence of meeting the requirements of 29 CFR, Part 1910, should be the receipt of a manufacturer's certificate of compliance, stating the equipment procured with this specification is in accordance with the applicable requirements of 29 CFR, Part 1910, as applicable. Such evidence should be acceptable to the contracting officer.

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6.3.2 Design verification. The manufacturer should furnish data to verify compliance with the fan performance as specified in 3.7.3.

6.3.3 Foundations. Packaged baghouses shipped assembled to the installation site should not be furnished with concrete foundations, but should be furnished with detailed construction drawings indicating the weight of the equipment and the anchor bolt pattern required (see 3.9.1).

6.3.4 Induced draft fan design. Fan capacity should be verified by manufacturer's fan performance curves (see 3.7.3).

6.3.5 Technical manuals. The manufacturer should provide three commercial technical manuals normally prepared and supplied with the baghouse and related equipment.

6.4 Supersession data. This specification replaces military specification MIL-B-28685 dated 9 August 1990.

6.5 Part or Identifying Numbers (PINs). The specification number is used to form the PIN for the baghouse unit covered by this document (see 1.2). PINs for the baghouse units are established as follows:

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6.6 Subject term (key word) listing.

Gas fired
Hot water generator
Oil fired

MILITARY INTERESTS:

Custodians:

Navy - YD1

Air Force - 99

Review Activities:

Navy - MC

Air Force - 84

CIVIL AGENCY COORDINATION ACTIVITY:

GSA-FSS

Preparing Activity:

Navy - YD1

Project (4460-0065)