

[INCH-POUND]

A-A-59222

May 18, 1998

SUPERSEDING

W-F-2793

July 2, 1992

COMMERCIAL ITEM DESCRIPTION

FANS, CENTRIFUGAL, DRAFT, FORCED AND INDUCED

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 centrifugal fans used in low-pressure boilers (less than 15 pounds per square inch (psi) (103 kilopascal (kPa) operating pressure) and in medium and high pressure (greater than 15 psi (103 kPa) operating pressure) (coal, oil, and gas fired) power boiler plant systems.

2. **CLASSIFICATION.** The centrifugal fans shall be of the following types and styles, as specified (see 7.2):

TYPES

- Type I - Backward-curved blades.
- Type II - Radial-tip blades.
- Type III - Forward-curved blades.
- Type IV - Backward-inclined.
- Type V - Airfoil.
- Type VI - Radial blades.

STYLES

- Style 1 - Forced draft.
- Style 2 - Induced draft.

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.

A-A-59222

3. SALIENT CHARACTERISTICS.

3.1 Description. Centrifugal draft fans are used to develop drafts for use in power plant service. The fans create either forced or induced draft, or both in a balanced draft system. The fan unit shall consist of an electrical motor driven or a steam turbine driven centrifugal fan, a housing (scroll and side plates), controls, guards, and accessories. When feasible, all components shall be attached to a common base with provisions for fastening to a foundation. Style 1 and style 2 fan units shall be suitable for continuous boiler draft operation. The style 1 fan unit assembly shall operate with preheated air temperatures not greater than 250 degrees Fahrenheit (°F) (121 degrees Celsius (°C)). The style 2 fan unit assembly shall operate with flue gas temperatures not greater than 800 °F (427 °C). The equipment and accessories shall permit accessibility for maintenance and service in the field and be as such to prevent conditions hazardous to personnel or deleterious to equipment. The fan unit shall comply with AMCA 99, and system requirements as outlined in section 8 of AMCA 801, and testing requirements of AMCA 210, 203, or 803.

3.2 Standard commercial product. The fan unit shall, as a minimum, be in accordance with the requirements of this CID and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this CID, but which are a part of the manufacturer's standard commercial product, shall be included in the fan unit being furnished. A standard commercial product is a product which is being 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.

3.3 Interchangeability. All fan 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.

3.4 Fan. The fan shall be of the single- or double-width centrifugal type as specified (see 7.2). The direction of fan rotation and discharge, and the position of inlet boxes shall comply with the applicable standard designations of AMCA 99.

3.4.1 Capacity and performance. The fan rating shall be based on standard air at 70 °F (21 °C); 29.92 inches (101 kPa) barometric pressure (0.075 pound per cubic foot (1.201 kilogram per cubic metre)). The fan shall deliver at its standard rating, its rated capacity in cubic feet per minute (cubic metre per second) as specified (see 7.2) and at static pressure as specified (see 7.2). The fan shall static efficiency shall be not less than that specified in table I in standard air at best efficiency point.

TABLE I. Fan static efficiency.

Type	Static efficiency
I	70 percent
II	70 percent
III	60 percent
IV	70 percent
V	80 percent
VI	60 percent

A-A-59222

3.4.2 Fan wheel and shaft. The fan wheel (rotor) shall be of the backward-curved, forward-curved radial-tip blade backward inclined or airfoil type as specified (see 7.2). The fan wheel and shaft assembly shall be balanced statically and dynamically.

3.4.3 Sound power level. The sound power level shall be not greater than 90 decibels on the “A” scale (dBA) of a standard sound level meter at 3-foot (0.914 metre (m)) stations at a height of 4.5 feet (1.372 m). The sound power level shall drop not less than 10 dBA when measured at a distance of 25 feet (7.62 m) and 4.5 feet (1.372 m) in height. Equipment which cannot comply with an 90 dBA limit at a 3-foot (0.914 m) station shall be identified with appropriate documentation. Such documentation shall include the quantitative descriptions of the sound output of the equipment and also the quantitative information on the sound transmission between the source and the listener at 3-foot (0.914 m) station and the 25-foot (7.62 m) station. Upon notification by the contractor that the fan cannot comply with the requirements of this CID, the contracting officer shall furnish to the contractor one Hazardous Noise label for each fan (see 4.3).

3.4.4 Controls. Unless otherwise specified (see 7.2), the style 1 fan shall be equipped with a constant-speed driving unit and with adjustable inlet radial vanes. Unless otherwise specified (see 7.2), the style 2 fan shall be equipped with either parallel bladed inlet dampers for regulation of the air output volume, or manual or automatic positioning dampers. When specified (see 7.2), style 1 and style 2 fans shall have a variable speed reducer with percent reduction speed as specified (see 7.2).

3.4.5 Power unit. The fan shall be driven by a steam turbine or electric motor as specified (see 7.2). The power unit rating shall be sufficient for handling of the fan load at the fan capacity specified.

3.4.6 Turbine. The steam turbine shall conform to NEMA SM-23 and accommodate sufficient steam to meet conditions and information in part 9, Steam Turbine Inquiry Guide as specified (see 7.2).

3.4.7 Electric motor. The electric motor shall conform to NEMA MG-1 and be operable on electrical current with characteristics as specified (see 7.2). The electric motor shall be sized to bring fan up to full operating speed in 20 seconds or less.

3.5 Lubrication. Unless otherwise specified (see 7.2), a means for lubrication shall be in accordance with the manufacturer’s standard practice. The lubricating points shall be easily visible and accessible without removing protective guards. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high-pressure lubricating equipment, 1,000 psi (6 894 kPa) or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location.

3.6 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. The color of the finish coat shall be as specified (see 7.2). Surfaces to be painted shall be cleaned and dried to ensure they are free from

A-A-59222

contaminates such as oil, grease, welding slag and spatter, loose mill scale, water, dirt, corrosion product, or any other contaminating substances. As soon as practicable after cleaning and before any corrosion product or contamination can result, the surfaces shall be prepared or treated to ensure the adhesion of the coating system. The painting shall consist of at least one coat of primer and one finish coat. The primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes and the total dry film thickness shall be not less than 2.5 mils over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.7 Identification marking. Identification shall be permanently and legibly marked directly on the fan unit or on a corrosion-resisting metal plate securely attached to the unit at source of manufacturer. Identification shall include the manufacturer's model and serial number, name, and trademark to be readily identifiable to the manufacturer.

3.8 Workmanship.

3.8.1 All operations and processes involved in accomplishing the requirements of this CID shall be in accordance with the highest grade practices associated with this type of work.

4. REGULATORY REQUIREMENTS.

4.1 Materials. 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). Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this commercial item description 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 are allowed under this commercial item description.

4.2 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within specified tolerances using conversion tables contained in the latest version of ASTM SI-10 (IEEE/ASTM SI-10), and all other requirements of this commercial item description including form, fit, and function are met. If a product is manufactured to metric dimensions and these dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the contracting officer to determine if the product is acceptable. The contracting officer has the option of accepting or rejecting the product.

4.3 Sound power level. The sound power level specified herein are levels of noise normally produced by power plant fans. Some fans may be not greater than 90 dBA at the 3-foot

A-A-59222

(0.914 m) station. Sound power levels greater than 90 dBA should have engineering controls applied to the installation to reduce the sound power level to 90 dBA as specified in Code of Federal Regulations 29, part 1926.

5. QUALITY ASSURANCE 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 be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

6. PACKAGING. The preservation, packing, and marking shall be as specified in the contract or order.

7. NOTES.

7.1 Source of documents.

7.1.1 The Federal Acquisition Regulation (FAR) and Code of Federal Regulations (CFR) may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

7.1.2 AMCA Standards are available from the Air Movement and Control Association, 30 West University Drive, Arlington Heights, IL 60004.

7.1.3 ASTM Standards are available from the American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

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

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

7.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this CID.
- b. Type and style of fan required (see 2).
- c. Whether fan is to have single or double inlet, direction of rotation and discharge, rotation and discharge, and position of inlet boxes (see 3.4).
- d. Required rating capacity and static pressure at standard rating which may be adjusted to allow for operating in environmental conditions which may impact fan operation and noise levels i.e., temperature, altitude, and hostile environmental conditions (see 3.4.1).
- e. Type of wheel (rotor) required (see 3.4.2).

A-A-59222

- f. When the driving unit for the style 1 fan and controls for fans is to be different; when inlet dampers are to be different for style 2 fan. When variable speed is required and type of speed reducer with percent of reduction speed (see 3.4.4).
- g. Type of drive (steam turbine or electric motor); steam conditions and required information in part 9, Steam Turbine Inquiry Guide of NEMA SM-23 (see 3.4.5 and 3.4.6).
- h. When lubrication is to be different (see 3.5).
- i. Color of finish coat (see 3.6).

7.3 Supersession data. This CID replaces Federal Specification W-F-2793, dated July 2, 1992.

7.4 Classification cross reference. Classifications used in this CID (see 2.) are identical to those found in superseded Federal Specification W-F-2793.

7.5 Pin Identification Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for items acquired to this description are created as follows:

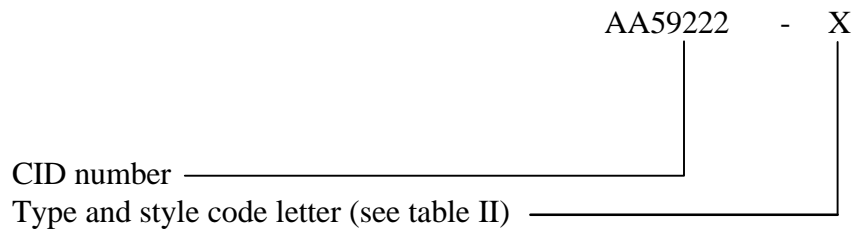


TABLE II. Code letter to type and style.

Style	Type					
	I	II	III	IV	V	VI
1	A	C	E	G	I	L
2	B	D	F	H	J	M

7.6 Metric units. The values stated in either inch-pound or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system should be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

7.7 Subject term (keyword) listing.

Air
Boiler
Fans
Flue gas
Power plant

A-A-59222

MILITARY INTERESTS:

Custodians:

Navy - YD1

Air Force - 99

Review Activities:

Air Force - 82

DSC - GS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA-FSS

Preparing Activity:

Navy - YD1

(Project 4140-0156)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
A-A-59222

2. DOCUMENT DATE (YYMMDD)
980518

3. DOCUMENT TITLE

FANS, CENTRIFUGAL, DRAFT, FORCED AND INDUCED

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*
(1) Commercial
(2) AUTOVON
(if applicable)

7. DATE SUBMITTED
(YYMMDD)

8. PREPARING ACTIVITY

a. NAME

RUSSELL REYNOLDS

b. TELEPHONE *Include Area Code)*

(1) Commercial 805-982-5946 (2) AUTOVON 551-5946

c. ADDRESS *(Include Zip Code)*

COMMANDING OFFICER, NCBC CODE 15E2C
1000 23RD AVENUE
PORT HUENEME, CA 93043-4301

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:

DEFENSE QUALITY AND STANDARDIZATION OFFICE
5203 Leesburg Pike, Suite 1403, Falls Church, VA 22401-3466
Telephone (703) 756-2340 AUTOVON 289-2340