

SECTION 23 86 00 - FANS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide labor, materials, equipment and services as required for the complete installation designed in Contract Drawings.

1.2 SUBMITTALS

- A. Submittals shall include all fans, motors, drives, and accessories. Include all fan curves and fan operating point.

1.3 QUALITY ASSURANCE

- A. Capacity, size and arrangement, static pressure, brake horsepower, component parts and accessories shall be provided as called for or scheduled. All ratings shall be made in accordance with AMCA Standard 210. Guaranteed full capacity delivery through duct systems finally installed and under conditions listed. The manufacturer shall guarantee sound-power level ratings not exceeding those of the design equipment. All equipment shall be statically and dynamically balanced to acceptable tolerances with weights permanently fastened. Fan wheels shall be rebalanced in the field, if necessary.

- B. Pressure Classification:

<u>Maximum Total Sp</u>	<u>Class</u>
Up to 3-3/4 in. WG-STD	I
Up to 6-3/4 in. WG-STD	II
Up to 12-3/4 in. WG-STD	III

- C. Motors:

1. Motors shall be furnished with each fan of sizes scheduled. Refer to specification Section 230180 for acceptable motor manufacturers. All belt-driven fan motors shall be mounted on either an adjustable slide base or a pivoting base.

- D. Drive Systems:

1. Provide fans with belt or direct drive systems as scheduled. V-belt drives as recommended by drive manufacturer, unless otherwise specified or scheduled.
- a) Size drive for 200% of motor rating, when motor is 10 hp and larger, 150% of motor horsepower, other applications.
- b) Motors 5 hp and larger shall be provided with a minimum of two matched belts. All belt sets shall be matched.
- c) Cast iron or cast steel pulleys.

- d) Provide a belt and shaft guards for each driven device. Provide openings in both the motor and fan sections of the guard so that the motor and fan speeds can be checked without removing the belt guard.
- E. Motor Pulleys:
 - 1. Adjustable type to produce 15% speed change above and below scheduled fan speed.
 - 2. 5 hp and smaller: "A" section, 2.6 in. minimum pitch diameter.
 - 3. 7-1/2 hp to 20 hp: "B" section, 4.6 in. minimum pitch diameter.
 - 4. 25 hp and larger: "C" section, 7.0 in. minimum pitch diameter.
 - 5. Drive ratio not over 4:1.
 - 6. Vibration isolation for units shall be furnished by fan manufacturer unless otherwise noted. Where spring vibration isolators are used, they shall be guided spring type.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL FANS

- A. All fan wheels shall be backwardly curved of a non-overloading blade design. Blades, double thickness airfoil design, single thickness airfoil design. Bearings mounting adjustable and self-aligning, 50,000 B-10 life hours rated in accordance with AFBMA. Equipped with overflow pipe and overflow reservoirs.
- B. Design Equipment: Greenheck.
- C. Make: Barry, Bayley, Buffalo Forge, Chicago, Greenheck, Twin City.

2.2 ROOF FANS (DOME TYPE)

- A. Centrifugal type fan wheel with backward curved blades. Spun aluminum housing. Fan enclosure with removable dome for access to motor, drive, bearings and fan wheel. Hinged at curb so that entire fan can be tilted upward for maintenance access to automatic dampers and damper motor. For belt driven units, the motor and drive shall be isolated from the airstream. The motor shall be mounted on an adjustable base. Permanently lubricated sealed motor bearings.
- B. Fan Bearings: 50,000 B-10 life hours per AFBMA.
- C. 1/2 in. x 1/2 in. aluminum mesh bird screen. Factory mounted and wired disconnect switch. Factory mounted and wired variable speed controller for all direct drive fans. Factory constructed roof curb in accordance with Section 238950.

- D. Design Equipment: Greenheck.
- E. Acceptable Make: ACME, Aerovent, Carnes, Cook, Greenheck, ILG, Penn.

PART 3 - EXECUTION

3.1 INSTALLATION OF EQUIPMENT

- A. Provide equipment in accordance with manufacturer's instructions. All fans shall meet the intent of the system performance requirements. Provide rubber in-shear vibration isolation for all fan unless otherwise called for differently. Provide necessary supporting ironwork and platforms for equipment as detailed on the contract drawings. Provide guards for all exposed belts, shafts and fan wheels. Change pulley sizes or adjust sheaves as required to make systems deliver specified quantities of air as listed on the Contract Drawings.

END OF SECTION