Design Standard
Fans

Purpose:

Fans are an essential element of the mechanical space ventilation, cooling, and heating systems. This design standard has the purpose of creating a consistent application of fan requirements throughout the East Side Union High School District, therefore achieving a standard of quality for maintenance, energy efficiency, and reliability throughout all renovation and new building projects.

Design Standard:

Design and specify work to include materials, installation, and testing of fans used for ventilation and exhaust service for a complete and operating system

- Fans shall be AMCA rated for sound and air performance.
- All fans shall be statically and dynamically balanced and test run at the factory.
- The motor horsepower shall not be less than 120% of fan bhp, non-overloading.
- Where variable speed drives are utilized, consider use of direct drive fans to reduce maintenance for belts. Consider fan's critical speed in selection of direct drive fans with variable speed operation.
- Fan types shall include but not be limited to:
  - Sidewall exhaust fans
  - Centrifugal belt drive roof exhaust fans
  - Utility sets
  - Inline cabinet fans
  - Plug fans
  - Wall propeller exhaust fans
  - Transfer filter fans
  - Duct mounted inline fans
  - Air curtains
- Dust Collectors
  - Design with material handling exhaust fan, heavy duty cotton sateen filters, explosion vent, (top mounted discharge silencer if required for acoustical attenuation) dust storage hopper. Housing of 14 gauge hot rolled steel base with extended legs providing 42 inch clearance below hopper. Paint

Finishes: One coat zinc chrome primer on interior and one coat grey machinery enamel on exterior.

- Heavy duty industrial type material handling direct drive exhaust fan.
- Filters: High efficient cotton sateen fabric with an efficiency rating of 99.9 percent by weight, allowing recirculation of the air. The filter pockets must have a metal insert to prevent the filter from collapsing and to maintain a positive connection to the filter shaker during the cleaning cycle. Foam inserts will not be allowed.
- Motorized shaker complete with motor. Solid state field adjustable controller governing shaking cycle duration, automatically actuated at each fan shutdown. Shaker must be high frequency type for maximum cleaning.
- Factory mounted and wired NEMA 4 control panel including magnetic starters with heaters for the blower motor and shaker motor. Single point electrical connection, provide for field wiring required for externally mounted start/stop station supplied by factory.
- Explosion vent designed for vacuum service to be supplied with the dust collector for field installation. The explosion vent is to be the same diameter as the main duct and installed in "T" connection at the highest point prior to entering the dust collector.

- Energy Recovery Units
  - General: Outdoor heat recovery ventilator designed for rooftop or indoor mounting with separate supply and exhaust blowers.
  - Weatherproof, galvanized steel frame and panels, with 18 gauge steel where panels are exposed to the weather. Overlapping top seams. Provide moisture eliminator testing in accordance with AMCA Standard 500-L to prevent water penetration up to 3 inches per hour at 29 miles per hour.
  - Insulation: 1-inch fiberglass, meeting UL 181 erosion requirements.
  - Energy Recovery Wheel: Silica gel enthalpy type and ARA certified to Standard 1060. Polymer media construction. Drive Belt: High strength urethane.
  - Access Doors: Removable for servicing components.
  - Roof Curb: Weathertight with gasket and designed to carry gravity and seismic loads.

Approved Manufacturers:

- Fans
  - Greenheck
  - Cook
  - Penn
  - Twin Cities
- Air curtains
  - Mars
  - Dravo Corporation
  - Berner International
- Dust collectors
  - Sternvent
  - Torit
  - American Air Filter
- Energy recovery units
  - Greenheck
  - Innovent
  - Aaon
  - Haakon

Substitutes Allowed:

Yes, if performance and quality equivalency can be evidenced.

Associated Design Standards and Construction Specifications

- Division 23 HVAC Design Standards
- 23 05 29 - Hangers and Supports for HVAC Piping And Equipment Design Standard
- 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment Design Standard
- 23 05 53 - Identification for HVAC Piping and Equipment Design Standard
- 23 05 93 - Testing, Adjusting and Balancing Design Standard
- 23 31 00 – Ductwork Design Standard

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