

SECTION 23 40 00 - AIR CLEANING

PART I - GENERAL

1.1 WORK INCLUDES

- A. Ventilation Contractor provides:
 - 1. Filters and Filter Media.
 - 2. Filter Frames.
 - 3. Filter Gauges.

1.2 REFERENCES

- A. ANSI/UL 586 Test Performance of High Efficiency Particulate, Air Filter Units.
- B. ANSI/UL 900 Test Performance of Air Filter Units.
- C. ASHRAE 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- D. ANSI/NFPA 70 National Electrical Code.

1.3 QUALITY ASSURANCE

- A. Filter media shall be ANSI/UL 900 listed, Class 1 or Class 2, as approved by local authorities.
- B. Provide all filters and filter banks by one manufacturer.

1.4 SUBMITTALS

- A. Submit shop drawings per *Section 01 33 23 – Shop Drawings, Product Data, and Samples*. Include data on media, performance, assembly and frames.

1.5 EXTRA STOCK

- A. When specified in project - Preoccupancy Building Purge: Provide one set of Merv 8 and one set of Merv 11 filters in each unit for preoccupancy building purge in accordance with LEED pre-requisites and credits. Replace loaded filters during flush out period.
- B. Coordinate and provide additional filter set(s) for compliance during allowed use of permanent equipment for and during construction.
- C. Provide clean filters in all units at time of installation if equipment will not be allowed to be used for/and during Construction and if flush out procedure is not utilized.
- D. Provide one additional set of replacement filters for all units beyond standard sets listed under internal components and not in conflict with LEED. Provide clean filters in all units at project final completion after all interior finishes are complete.

PART 2 - PRODUCTS

2.1 MEDIUM EFFICIENCY, DISPOSABLE, TYPE D

- A. Non-woven cotton fabric, pleated media, disposable type with welded wire grid support bonded to the filter media.
- B. Heavy duty, paper board frame with diagonal support members bonded to inlet and exit sides of each pleat. Bond frame to media periphery to eliminate air bypass.
- C. 4" thick media with at least 4.6 square feet of media per square foot of face area. Maximum initial resistance of 0.30" WG at 500 fpm face velocity.
- D. 25-30% efficiency and 90-92% arrestance per ASHRAE 52.1 or MERV 8 per ASHRAE 52.2.

- E. Acceptable Manufacturers: Farr, Continental or American Air Filter.
- 2.2 65% EFFICIENT ARRESTANCE (52.1) BAG FILTER, TYPE H
- A. Disposable type with high density, fine fiber glass media with reinforced backing and galvanized steel face frame.
 - B. Self supporting bags without sag under airflow reduced to 25% of the maximum design flow.
 - C. Individual pleats shall have sealed link stitching to maintain their shape.
 - D. Minimum of 22". At least 17.5 square feet of media per square foot of face area.
 - E. 60-65% efficiency and >98% arrestance per ASHRAE 52.1 or MERV 11 per ASHRAE 52.2. Maximum 0.22" WG initial resistance at 375 fpm face velocity.
 - F. Acceptable Manufacturers: Farr, Continental or American Air Filter.
- 2.3 85% EFFICIENT ARRESTANCE (52.1) BAG FILTER, TYPE I
- A. Disposable type with high density, fine fiberglass media with reinforced backing and galvanized steel face frame.
 - B. Self supporting bags without sag under airflow reduced to 25% of the maximum design flow.
 - C. Individual pleats shall have sealed link stitching to maintain their shape.
 - D. Depth of 22". At least 25.25 square feet of media per square foot of face area.
 - E. 80-85% efficiency average 95% arrestance per ASHRAE 52.1 or MERV 13 per ASHRAE 52.2. Maximum 0.35" WG initial resistance at 375 fpm face velocity.
 - F. Acceptable Manufacturers: Farr, Continental or American Air Filter.
- 2.4 95% EFFICIENT ARRESTANCE (52.1) BAG FILTER, TYPE J
- A. Disposable type with high density, fine fiberglass media with reinforced backing and galvanized steel face frame.
 - B. Self supporting bags without sag under airflow reduced to 25% of the maximum design flow.
 - C. Individual pleats shall have sealed link stitching to maintain their shape.
 - D. Depth of 22". At least 17.5 square feet of media per square foot of face area.
 - E. 90-95% efficiency average 99% arrestance per ASHRAE 52.1 or MERV 14 per ASHRAE 52.2. Maximum 0.55" WG initial resistance at 375 fpm face velocity.
 - F. Acceptable Manufacturers: Farr, Continental or American Air Filter.
- 2.5 FILTER FRAMES
- A. Provide standard frames. Provide additional structural supports as required to maintain minimal deflection at worst case operating condition. Worst case condition is snow packed filters at maximum air flow.
- 2.6 FILTER GAUGES
- A. *[Note to AE: Coordinate this section with Section 23 09 13 - Instrumentation and Control Devices for HVAC and Section 23 09 23 – Building Automation System (BAS) for HVAC.]*
The Default shall be to have the BAS Contractor provide DP device analog integration back to the BAS for trending and alarming. If a BAS Contractor is absent from the Project, this Contractor shall provide the following:
 - 1. Differential Pressure Gauge: Diaphragm actuated, nominal 3" round dial, glass filled nylon housing, polycarbonate lens, zero adjustment, 0-2" W.G. range, 5% of full scale accuracy, 0.05" increment.
 - 2. Accessories: Static pressure tips with integral compression fittings and 1/8" NPT plastic tubing.

3. Acceptable Manufacturers: Dwyer Series 3000SGT PhotohelicÂ Pressure Switch / Gage with integral transmitter or pre-approved equal from Mid-West or Ashcroft Instruments.

B. Coordinate integration of analog signal and alarming back to BAS.

2.7 HIGH EFFICIENCY FILTER TEST HOLE

A. 1-1/2" gasketed instrument type test hole with heavy screw cap.

B. Acceptable Manufacturers: Ventlok 699 or *[Note to AE: Include 2 additional Owner-approved manufacturers]*.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all products per manufacturers' instructions.

B. Seal filter media to prevent passage of unfiltered air around filters with rubber or neoprene gaskets.

C. Install static pressure taps upstream and downstream of each bank of filters. Mount filter gauges on outside of filter housing or filter plenum, in accessible position. Adjust and calibrate. Every filter bank, including packaged units, shall have a filter gauge.

D. Install four (4) high efficiency filter test holes, two upstream and two downstream, at all high efficiency filter banks in air handling units and ductwork (85% efficiency and higher). Coordinate location of test holes with Owner.

END OF SECTION **23** 40 00

This section of the *U of I Facilities Standards* establishes minimum requirements only. It should not be used as a complete specification.