

SECTION 15885

AIR CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Disposable Panel Pre-Filters.
2. Extended Surface Retained Media Filters.
3. Extended Surface High Efficiency Media Filters.
4. High Efficiency Particulate Air (HEPA) Filters.
5. Activated Carbon Filters.
6. Filter Frames.
7. Filter Gages.

B. Related Sections:

1. Section 15010 - Basic Mechanical Requirements.
2. Section 15855 - Air Handling Units with Coils.
3. Section 15900 - Ductwork and Accessories.

1.02 REFERENCES

- A. ASHRAE 52 - Method of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
- B. ANSI/UL 586 - Test Performance of High Efficiency Particulate, Air Filter Units.
- C. ANSI/UL 900 - Test Performance of Air Filter Units.
- D. MIL-STD-282 - Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance-Test Methods.

1.03 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 as product of one manufacturer.
- C. Assemble filter components to form filter banks from products of one manufacturer.

1.04 SYSTEM DESCRIPTION

A. Design Requirements:

1. All air supplied by a forced air type unit or system shall be filtered.

2. Single filter installation or a pre-filter-intermediate filter combination shall be upstream

from the coils and blow-through fans, as well as exhaust energy-recovery units.

3. After-filter, where required, shall be on the discharge side of the fan and downstream from all coils.
4. Adequate clearances must be allowed for cleaning or changing filters.
5. In general, air filtration systems shall utilize replaceable, dry type extended surface media having an efficiency of 36 percent (MERV 7), based on ASHRAE Standard No. 52 Atmospheric Dust Spot Test for me filters.

LEED EQc3: Construction IAQ Management Plan:
Final filter Minimum Efficiency Reporting Value (MERV) of 13 is required. This is approximately an 85% dust spot efficiency.

6. Where space allows, a pre-filter (MERV 7) and primary filter (MERV 11) shall be provided.
7. Media shall be supported to minimize flexing during start-stop fan cycles.
8. MERV 8 rating or better pre-Filters shall be included during the construction phase and shall be considered for permanent installation where necessary.

LEED EQc3: Construction IAQ Management Plan:
MERV 8 rating or better

9. Each filter bank shall be equipped with a Magnehelic or similar gage that indicates static pressure drop across the filters. One gage for two-stage filter banks is acceptable.
10. The design change-out pressure drop, in inches water gage, shall be indicated on the gauge.
11. Built-up filter frames shall be specified to accommodate the replacement media of not less than three filter manufacturers.
12. Air filtration systems for clean rooms and special clean areas shall be designed for ease of filter maintenance and minimum interruption of operation.
13. Specify extended surface high efficiency media filters where the filtering of biological organisms is required.
14. Specify HEPA filters where very high efficiency filtering is required.
15. Consider activated carbon filters where odor control is required, or other odor-control systems such as Cosatron (TM).
16. Specify "Extra Stock" to be provided to insure that a completely clean set of filter media is available at project completion.

17. The initial set of filter media is to be used for testing and trial use and will not be used at project completion.

18. For LEED 3.1: Provide MERV 13 (85%) filters for final filter at beneficial occupancy.

PART 2 - PRODUCTS

2.01 DISPOSABLE PANEL PRE-FILTERS

A. Manufacturers:

American Air Filter
Farr
Flanders
Grainger

B. Media: 2 inch minimum (4 inch preferred) fiber blanket, factory sprayed with flameproof, non-drip, non-volatile adhesive, nominal size 24 by 24 inches.

C. Rating: 500 FPM Face velocity, 0.15 inch WG initial resistance, 0.50 inches WG recommended final resistance.

D. Casing: Cardboard frame with perforated metal retainer.

E. Holding Frames: 20 gage minimum galvanized steel frame with expanded metal grid on outlet side and steel rod grid on inlet side, hinged with pull and retaining handles.

2.02 EXTENDED SURFACE RETAINED MEDIA FILTERS

A. Manufacturers:

American Air Filter
Farr
ULOK Fiberbond

B. Media: Pleated, non-woven cotton fabric, scrim reinforced; supported by welded steel retainer; in 16 gage steel holding frame with corrosion resistant coating; effective media area 50 sq. ft. per 1000 CFM capacity rating. Nominal size 24 by 24 by 12 inches deep.

C. Rating: ASHRAE 52: 60 percent dust spot efficiency (MERV 11), 96 percent average weight arrestance; 500 FPM face velocity, initial resistance, 0.50 inch WG, recommended final resistance 1.2 inch WG above initial resistance.

2.03 EXTENDED-SURFACE HIGH EFFICIENCY MEDIA FILTERS

A. Manufacturers:

American Air Filter
Farr
ULOK Fiberbond

B. Media: Pleated, water-resistant glass fiber with aluminum or kraft separators; in 16 gage
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steel holding frame with corrosion resistant coating. Nominal size 24 by 24 by 12 inches deep.

- C. Rating: ASHRAE 52: 95 percent dust spot efficiency; effective media are 50 sq. ft. per 1000 CFM capacity rating, 0.65 inch w.q. initial resistance, 1.0 inch w.q. recommended final resistance.

2.04 HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTERS

A. Manufacturers:

American Air Filter
Farr
Flanders
MSA
Weber

- B. Media: Pleated, water-resistant glass fiber with aluminum separators; ANSI/UL 586; in 16 gage zinc coated steel holding frame; nominal size 24 by 24 by 12 inches deep.
- C. Rating: 0.3 micron dioctyl phthalate smoke (DOP) to 99.97 percent efficiency, in accordance with MIL-STD-282 thermal (DOP) penetration test method; 250 FPM face velocity, 1.0 inch WG initial resistance, 3.0 inch WG recommended final resistance.

2.05 ACTIVATED CARBON FILTERS

A. Manufacturers:

American Air Filter
Barneby-Sutcliffe
Farr

- B. Assembly: Galvanized steel unit incorporating extruded aluminum tracks to accommodate filter servicing trays in deep V arrangement arranged for upstream downstream side servicing with disposable panel pre-filter.
- C. Media: Activated carbon density 34 lb/cu ft pelletized or granular to 6 by 10 Tyler mesh screen; minimum carbon tetrachloride activity of 60 percent; in thin bed trays, nominal size 24 by 24 by 1 inch thick; 9 lbs. of carbon per 2000 CFM air flow capacity.
- D. Rating: 500 FPM face velocity, 0.45 inch WG initial resistance.

2.06 FILTER FRAMES

- A. General: Fabricate filter frames and supporting structures of 16 gage galvanized steel or extruded aluminum T-section construction with necessary gasketing between frames and walls. Corners of frames shall be welded.
- B. Standard Sizes: Provide for interchangeability of filter media of other manufacturers; for panel filters, size for 24 by 24 inches filter media, minimum 2 inches thick; for extended surface and high efficiency particulate air filters, provide for upstream mounting of panel filters.

- C. Side Servicing Housings: Flanged for insertion into ductwork, or reinforced 16 gage galvanized steel; access doors with continuous gasketing and positive locking devices on both sides; extruded aluminum tracks or channels for primary <and secondary>,<secondary and tertiary> filters with positive sealing gaskets.

2.07 ELECTROSTATIC FILTER

- A. Shall be used only with prior permission of UCCS personnel.

2.08 FILTER GAGES

- A. Manufacturer:

Dwyer

- B. Direct Reading Dial: 4-3/4 inch OD diaphragm actuated dial in metal case, vent valves, black figures on white background, front recalibration adjustment, appropriate ranges of 0.05, 0-1.0, 0-2.0, 0-3.0 or 0-4.0 inch WG, 2 percent of full scale accuracy; Magnehelic Series 2000 manufactured by Dwyer.
- C. Accessories: Static pressure tips with integral compression fittings, 1/4 inch aluminum tubing, 2-way or 3-way vent valves.
- D. Inclined manometer: Not acceptable.

PART 3 - EXECUTION

- 3.01 In general, for project specifications, remove "Design Requirements" sub-paragraph A in Part 1, paragraph 1.04 "System Description" of this Design Guide and use list to expand on specific requirements of installation for each product specified.

END OF SECTION