



SECTION 23 40 00 - HVAC AIR CLEANING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Activated carbon filters.
 - 2. Extended surface rigid air filter with synthetic media.
 - 3. Disposable panel filters.
 - 4. Filter gages.
 - 5. Bipolar Ionization.

1.2 REFERENCES

- A. Air-Conditioning and Refrigeration Institute:
 - 1. ARI 850 - Commercial and Industrial Air Filter Equipment.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
- C. Underwriters Laboratories Inc.:
 - 1. UL 586 - High-Efficiency. Particulate, Air Filter Units.
 - 2. UL 867 - Electrostatic Air Cleaners.
 - 3. UL 900 - Air Filter Units.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate filter assembly and filter frames, dimensions, motor locations and electrical characteristics and connection requirements.
- B. Product Data: Submit data on filter media, filter performance data, dimensions, and electrical characteristics.
- C. Submit performance data for this application including initial pressure drop, recommended replacement pressure drop and maximum pressure drop.
- D. Manufacturer's Installation Instructions: Submit assembly and change-out procedures.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.



1.4 WARRANTY

- A. Provide one-year minimum.

PART 2 - PRODUCTS

2.1 ACTIVATED CARBON FILTERS

- A. Manufacturers:
 - 1. **Flanders.**
 - 2. **Camfil-Farr.**
 - 3. **American Air Filter.**
- 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.
 - 1. Nominal Size: 12 x 24 x 29 inches or 24 x 24 x 29 inches.
- C. Media:
 - 1. Activated Carbon Density: 34 lb./cu ft, pellets or granular to 6 x 10 Tyler mesh screen.
 - 2. Carbon Tetrachloride Activity: Minimum 60 percent; in thin bed.
 - 3. Trays: Nominal size 24 x 24 x 5/8 inches thick.
 - 4. Carbon: 1.42 cu ft per 1000 cfm nominal airflow capacity.
- D. Rating: 500 fpm face velocity, 0.45 inch WG resistance.

2.2 EXTENDED SURFACE RIGID AIR FILTER WITH SYNTHETIC MEDIA.

- A. Description: Efficiencies as listed by ASHRAE 52.2: MERV 15 (90-95%); MERV 14 (80-85%)
- B. Manufacturers:
 - 1. **Flanders.**
 - 2. **Camfil-Farr.**
 - 3. **American Air Filter.**
- C. Media: UL 900 Class 2, pleated, lofted, non-woven, reinforced synthetic fabric or fine, glass fiber laminated to synthetic backing.
 - 1. Frame: Stainless steel.
 - 2. Nominal size: 24 x 24 inches
 - 3. Nominal thickness: As required for scheduled efficiency rating.



- D. Tested per ASHRAE 52.1:
 - 1. Dust spot efficiency: See schedule on drawings.
 - 2. Weight resistance: See schedule on drawings.
 - 3. Initial resistance at 500 fpm face velocity: See schedule on drawings.
 - 4. Recommended final resistance: See schedule on drawings.

2.3 DISPOSABLE PANEL FILTERS

- A. Description: Factory-fabricated, dry, extended-surface filters with stainless steel holding frames.
- B. Manufacturers:
 - 1. **Tridem.**
 - 2. **Camfil-Farr.**
 - 3. **American Air Filter.**
- C. Media: Synthetic glass fibrous material and other media pleated, UL Class II, 25-30 percent efficiency (MERV 8) formed into deep-V-shaped pleats and held by self-supporting wire grid.
 - 1. Nominal Size: 24 x 24 inches.
 - 2. Thickness: 1 or 2 inch.
- D. Media and Media-Grid Frame: Nonflammable glass fiber, synthetics and other media to ensure adequacy for jet fuel.
- E. Performance Rating:
 - 1. Face Velocity: 500 fpm.
 - 2. Initial Resistance: 0.15 inch WG.
 - 3. Recommended Final Resistance: 0.50 inches WG.
- F. Duct-Mounting Frames: Stainless steel with gaskets and fasteners and suitable for bolting together into built-up filter banks.
 - 1. Manufacturer:
 - a. **Pyramid Filters.**
 - b. **Perkins Thermal Systems.**
 - c. **Guru Filtration System.**

2.4 FILTER GAGES

- A. Manufacturers:
 - 1. **Dwyer.**
 - 2. **Trerice.**
 - 3. **Weiss.**



- B. Direct Reading Dial: 3-1/2 inch diameter diaphragm actuated dial in metal case. Furnish vent valves, black figures on white background, front calibration adjustment, range 0-3.0 inch WG 2 percent of full scale accuracy.
- C. Accessories: Static pressure tips with integral compression fittings, 1/4 inch plastic tubing, 2-way or 3-way vent valves.

2.5 BIPOLAR IONIZATION

- A. Manufacturers
 - 1. **Plasma Air International.**
 - 2. **Aerisa.**
 - 3. **AtmosAir.**
- B. Performance Criteria
 - 1. The bipolar ionization system shall be capable of controlling gas phase contaminants generated from human occupants as well as products of combustion of jet fuel.
 - 2. Capable of reducing static space charges.
 - 3. Capable of reducing common VOCs encountered in airport terminals and associated buildings.
 - 4. Equipment shall be capable of performing in non-condensing atmospheres at temperatures up to 140 degrees F.
 - 5. Provide 5 year warranty.
- C. Equipment Requirements
 - 1. The bipolar ionization units shall include all power supplies, ion generating tubes, gaskets, indicators, switches, fuses, and accessories necessary for safe and efficient operation.
 - 2. All duct mounted applications shall include a mounting frame permanently attached to the duct. Ionization units shall be attached to the mounting frame.
 - 3. Ionization Tubes shall be UL or ETL listed and bear the UL or ETL mark and have a useful life of 17,000 hours before replacement is required.
 - 4. The manufacturer shall provide ionization tubes of appropriate size and quantity for each air handling system to meet the requirements for the system.
 - 5. All exposed metallic parts of ionization tubes shall be stainless steel.
 - 6. Ionization units shall be suitable for duct mounting or air handling unit plenum mounting.
 - 7. Ionization units shall be plenum rated per UL 2043.
 - 8. Ionization unit output shall be user adjustable from approximately 50-100%. There shall be a minimum of five levels of adjustment.
 - 9. An integral differential pressure switch shall be provided on duct mounted one-and two-tube units. Additional controls such as field mounted pressure switches or control relays shall be included as part of the ionization equipment scope.



D. Installation Requirements

1. Ionization units shall be installed per manufacturer's installation instructions.

E. Electrical Requirements

1. The electrical power wiring to the ionization units shall be detached without the use of tools to facilitate servicing of the equipment.
2. Ionization units shall be available for 120 and 240 volt applications.
3. The maximum power required for multi tube ionization units shall be 50 watts.
4. The electrical contractor shall provide shall a junction box with single outlet within 4 feet of the ionization equipment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install filters with felt, rubber, or neoprene gaskets to prevent passage of unfiltered air around filters.
- B. Install filter gage static pressure tips upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum, in accessible position. Adjust and level.
- C. Do not operate fan system until temporary filters are in place. Replace temporary filters used during construction and testing, with clean set.
- D. Install filter gages on filter banks with separate static pressure tips upstream and downstream of filters.
- E. Install filters in accordance with manufacturer's recommendations.

3.2 TRAINING

- A. Provide minimum of 12 hours each (3 shifts) of classroom and hands on training to LAWA Facilities and Maintenance Division personnel.

END OF SECTION 23 40 00