

**SECTION 23 41 00
PARTICULATE AIR FILTRATION**

PART 1 - GENERAL

1.1 STIPULATIONS

- A. The specifications sections "General Conditions to the Construction Contract", "Special Conditions" and "Division 01 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pleated panel filters
 - 2. Side-access filter housings
 - 3. Filter gauges
- B. This Section applies to the filters upstream of the IFB coils associated with the DOAS units.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include dimensions; operating characteristics; required clearances and access; rated flow capacity, including initial and final pressure drop at rated airflow; efficiency and test method; fire classification; furnished specialties; and accessories for each model indicated.
- B. Shop Drawings: For air filters. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show filter rack assembly, dimensions, materials, and methods of assembly of components.
 - 2. Include setting drawings, templates, and requirements for installing anchor bolts and anchorages.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each filter, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of filter and rack to include in emergency, operation, and maintenance manuals.

1.6 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Provide one complete spare set of each type of filter in each filter bank. This is in addition to the clean set provided at turnover.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in a clean, dry place.
- B. Comply with manufacturer's written rigging and installation instructions for unloading and moving to final installed location.
- C. Handle products carefully to prevent damage, breaking, denting, and scoring. Do not install damaged products.
- D. Protect products from weather, dirt, dust, water, construction debris, and physical damage.
 - 1. Retain factory-applied coverings on equipment to protect finishes during construction and remove just prior to operating unit.
 - 2. Cover unit openings before installation to prevent dirt and dust from entering inside of units. If required to remove coverings during unit installation, reapply coverings over openings after unit installation and remove just prior to operating unit.
 - 3. Replace installed products damaged during construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASHRAE 52.2 for MERV for methods of testing and rating air-filter units.
- B. Comply with NFPA 90A and NFPA 90B.
- C. Comply with UL 900.
- D. Source Limitations: Obtain all filters of a particular type from a single source and from a single manufacturer.

2.2 PLEATED PANEL FILTERS

- A. Description: Factory-fabricated, self-supported, extended-surface, pleated, panel-type, disposable air filters with holding frames.
- B. Capacities and Characteristics: Minimum MERV-8 according to ASHRAE 52.2, using 2" deep filters.
 - 1. Filters and filter media frames shall maintain their structural integrity up to 1.25" w.g. pressure drop.
 - 2. Utilize only 24"x12" and 24"x24" filters.

- C. Media Construction: Interlaced glass or synthetic fibers coated with nonflammable adhesive.
 - 1. Galvanized steel welded-wire or expanded metal grid shall maintain pleat spacing. Grid shall be bonded to the media to maintain pleat configuration.
 - 2. Filter-Media Frame: Plastic or Galvanized steel frame sealed or bonded to the media to prevent air bypass. Support members on upstream and downstream sides to maintain pleat spacing.
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Air Filter (AAF) Co. / Flanders
 - 2. AirGuard; a Div. of Parker Hannifin Corp.
 - 3. Air-Nu
 - 4. Camfil
 - 5. Columbus Industries, Inc.
 - 6. Filtration Group
 - 7. Glasfloss Industries
 - 8. Koch Filter Corporation
 - 9. Tri-Dim Filter Corporation
 - 10. Equal as Approved by the Professional.

2.3 SIDE-ACCESS FILTER HOUSINGS

- A. Description: Factory-assembled, side-service housings, with flanges to connect to duct or casing system, and holding tracks / channels for securing media.
- B. Materials: Stainless steel or aluminum double-wall casing with minimum 1-inch thick insulation.
 - 1. Mounted Magnahelic gauges.
 - 2. Pressure taps and fittings.
- C. Filter Bank: Pleated panel filters arranged in a V-bank or flat bank, as indicated on the Drawings.
- D. Sealing: Incorporate positive-sealing with pile seals along the length of the support tracks / channels to seal top and bottom of the filter frames, and end gaskets to seal the ends of filter frames, in order to prevent bypass of unfiltered air.
- E. Access Doors: Hinged, with continuous gaskets on perimeter and positive-locking devices, and arranged so filter cartridges can be loaded from either access door. Doors shall also be fitted with gaskets to seal the ends of filters where they contact the door.
- F. Source Limitations: Obtain from single source from single manufacturer.
- G. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Air Filter (AAF) Co. / Flanders
 - 2. AirGuard; a Div. of Parker Hannifin Corp.
 - 3. Camfil
 - 4. Filtration Group
 - 5. Koch Filter Corporation

6. P&G Manufacturing
7. Equal as Approved by the Professional.

2.4 FILTER GAUGES

- A. Provide a gauge for each individual filter bank.
- B. Diaphragm-type gauge with dial and pointer in metal case, vent valves, black figures on white background, and front recalibration adjustment.
 1. Gauge shall maintain a +/- 4 percent accuracy of full scale within operating temperature limits of -20 deg. F. to 140 deg. F.
 2. Diameter: 4 inches.
 3. Weatherproof to IP67.
- C. Scale Range: 0- to 1.0-inch wg.
- D. Accessories: Static-pressure tips, tubing, gauge connections, and mounting bracket.
 1. Static-Pressure Tips: Provide a pair of Dwyer A-301 or A-302 series static pressure tips for each gauge.
 2. Tubing: 1/4" diameter aluminum, stainless steel, or copper.
- E. Source Limitations: Obtain from single source from single manufacturer.
- F. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Dwyer Instruments, Inc. (Series 2000 Magnahelic)
 2. Mid-West Instrument
 3. Orange Research Inc.
 4. Equal as Approved by the Professional.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine ducts, air-handling units, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PROTECTION

- A. Protect installed products and accessories from damage during construction.

3.3 INSTALLATION OF FILTERS

- A. Install filter frames according to manufacturer's written instructions.

- B. Position each filter unit with clearance for normal service and maintenance. Anchor filter holding frames to substrate.
- C. Install filters in position to prevent passage of unfiltered air.
- D. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing with new, clean filters at the time of turnover. Provide an additional set(s) of filters as described herein under "Extra Materials".
- E. Coordinate filter installations with duct and air-handling-unit installations.
- F. Install filter gauge for each filter bank.
- G. Install filter-gauge, static-pressure taps upstream and downstream from filters. Install filter gauges on filter banks with separate static-pressure taps upstream and downstream from filters. Mount filter gauges on outside of filter housing or filter plenum in an accessible position. Adjust and level inclined gauges.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections with the assistance of a factory-authorized service representative.
- C. Tests and Inspections:
 - 1. Test for leakage of unfiltered air while system is operating.
 - 2. Air filter will be considered defective if it does not pass tests and inspections.
 - 3. Prepare test and inspection reports.

3.5 CLEANING

- A. After completing system installation and testing, adjusting, and balancing of air-handling and air-distribution systems, clean filter housings and install new filter media.

3.6 TRAINING AND DEMONSTRATION

- A. Train Client Agency's maintenance personnel as specified below:
 - 1. Train Client Agency's maintenance personnel on procedures and schedules related to filter installation / replacement.
 - 2. Review data in the maintenance manuals.
 - 3. Schedule training with Client Agency, through the Professional, with at least 7 days' advance notice.

END OF SECTION