

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 23 05 00 – Common Work Results for HVAC
- .2    Section 23 73 10 – Air Handling – Built-up
- .3    Section 23 82 19 – Fan Coil Units.
- .4    Section 25 30 02 – EMCS – Field Control Devices

**1.2                REFERENCES**

- .1    American National Standard Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
  - .1    ANSI/ASHRAE 52.2-2007, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particulate Size (ANSI approved).
- .2    Canadian General Standards Board (ONGC or CGSB)
  - .1    CAN/CGSB-115.10, Disposable Air Filters for the Removal of Particulate Matter from Ventilating Systems.
  - .2    CAN/CGSB-115.14, High Efficiency Cartridge Type Supported Air Filters for the Removal of Particulate Matter from Ventilating Systems.
  - .3    CAN/CGSB-115.15, High Efficiency Rigid Type Air Filters for Removal of Particulate Matter from Ventilating Systems.
  - .4    CAN/CGSB-115.18, Filter, Air, Extended Area Panel Type, Medium Efficiency.
- .3    International Organization of Standardization (ISO)
  - .1    ISO 14644-1, Clean Rooms and Associated Controlled Environments - Part 1: Classification of Air Cleanliness.
- .4    National Fire Protection Association (NFPA)
  - .1    NFPA 96-[11], Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- .5    Underwriters' Laboratories of Canada (ULC)
  - .1    ULC -S111, Standard Method of Fire Tests for Air Filter Units.
  - .2    ULC-S646, Exhaust Hoods and Related Controls for Commercial and Institutional Kitchens.
- .6    US Department of Defense - Test Method Standard
  - .1    MIL-ST5-282, Filter Units, Protective Clothing, Gas-Mask Components and Related Products; Performance Test Methods.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for HVAC filters and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Canada, OIQ member.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

#### **1.4 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Where materials or products are specified by their trademark, consult the Instructions to Bidders document for the procedures to follow regarding the request for approval for materials or product replacement.
- .2 Extra Materials:
  - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Furnish list of individual manufacturer's recommended spare parts for equipment such as frames and filters, addresses of suppliers, list of specialized tools necessary for adjusting, repairing or replacing for inclusion in operating manual.
  - .3 Spare filters: in addition to filters installed immediately prior to acceptance by Departmental Representative, supply 1 complete set of filters for each.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, ideally indoors or in a clean, dry, well ventilated area and in accordance with manufacturer's recommendations.
  - .2 Store and protect HVAC filters from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

### **Part 2 Products**

#### **2.1 GENERAL**

- .1 Media: suitable for air at 100% RH and air temperatures between -40 and 50 degrees C.
- .2 Number of units, size and thickness of panels, overall dimensions of filter bank, configuration and capacities: as specified in the mechanical tables on plan.
- .3 Pressure drop when clean and dirty, sizes and thickness: as indicated on schedule.

## **2.2 ACCESSORIES**

- .1 Holding frames: permanent "T" section construction of galvanized steel same material as casing/hood, 1.6 mm thick, except where specified.
- .2 Seals: to ensure leakproof operation.
- .3 Blank-off plates: as required, to fit all openings and of same material as holding frames.
- .4 Access and servicing: through doors/panels on each side or face of filter bank.

## **2.3 CARTRIDGE PREFILTERS AND FILTERS – MERV 8**

- .1 Filter Media: deep pleated, disposable, high efficiency according to standard CAN/CGSB-115.14.
- .2 Dimension: 50 mm (2") thickness.
- .3 Holding frame: galvanized steel, with wind-bracing.
- .4 Media Support: welded wire mesh and clearing a surface of at least 96%.
- .5 Efficiency: MERV 8 according to standard ANSI/ASHRAE 52.2-2007.
- .6 Fire Rated: conform to standard ULC-S111.
- .7 Refer to the tables on plan for type and quantity.
- .8 Acceptable products:
  - .1 DAFCO Aerostar, series 400;
  - .2 Camfil Farr, model 30/30;
  - .3 American Air Filter, PerfectPleat HC M8;
  - .4 JAS Filtration, PrePleat 40 LPD.
  - .5 or a replacement product approved via addenda in accordance with Bidder instructions.

## **2.4 CARTRIDGE FILTERS – MERV 13**

- .1 Filter media: disposable, high efficiency, conform to CAN/CGSB-115.5 standard.
- .2 Dimensions: 100 mm (4") thickness.
- .3 Holding frame: galvanized steel, with wind-bracing.
- .4 Media Support: welded wire mesh and clearing a surface of at least 96%.
- .5 Efficiency: MERV 13 according to standard ANSI/ASHRAE 52.2-2007.
- .6 Fire Rated: conform to standard ULC-S111.
- .7 Refer to the tables on plan for type and quantity.
- .8 Acceptable products:
  - .1 DAFCO, AeroStar Green Pleat;
  - .2 Camfil Farr;
  - .3 American Air Filter, model VariCell II;
  - .4 JAS Filtration.

- .5 or a replacement product approved via addenda in accordance with Bidder instructions.

## **2.5 RIGID CARTRIDGE FILTERS – MERV 13 LOW PRESSURE LOSS**

- .1 Filters to use in the fresh air handling systems, system 100 and 200.
- .2 Filter media: in microfiber glass, disposable and high efficiency.
  - .1 High efficiency, according to standard CAN/CGSB-115.11.
  - .2 Average efficiency, according to standard CAN/CGSB-115.12.
- .3 Dimensions: 300 mm (12”) thickness.
- .4 Holding frame: galvanized steel.
- .5 Media support: welded galvanized sheet and clearing a surface of at least 96%.
- .6 Efficiency: MERV 13 according to standard ANSI / ASHRAE 52.2-2007.
- .7 Refer to the tables on plan for type and quantity.
- .8 Acceptable products:
  - .1 DAFCO, model FP Minipleat;
  - .2 Camfil Farr, model Durafil ES;
  - .3 American Air Filter, model VariCell VXL;
  - .4 JAS Filtration, model Super Flow V.
  - .5 or a replacement product approved via addenda in accordance with Bidder instructions.

## **2.6 FILTER GAUGES - DIAL TYPE**

- .1 Diaphragm actuated, direct reading.
- .2 Range: 0 to 250 Pa.

## **2.7 FILTER GAUGES - MANOMETER TYPE**

- .1 Inclined acrylic tube.
- .2 Complete with levelling screws.
- .3 Range: 0 to 250 Pa.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for filter installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 INSTALLATION GENERAL**

- .1 Install in accordance with manufacturer's recommendations and with adequate space for access, maintenance and replacement.

### **3.3 ACTIVATED CARBON TYPE FILTERS**

- .1 During testing, adjusting and balancing, install substitute media.
- .2 Install permanent media only after painting is completed.

### **3.4 REPLACEMENT MEDIA**

- .1 Replace media with new upon acceptance.
- .2 Filter media new and clean, as indicated by pressure gauge, at time of acceptance.

### **3.5 FILTER GAUGES**

- .1 Install type as indicated across each filter bank (pre-filter and final filter) in approved and easy readable location.
- .2 Mark each filter gauge with value of pressure drop for clean condition and manufacturer's recommended replacement (dirty) value.

### **3.6 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**