

PART 1 - GENERAL

1.1 REFERENCES

- .1 American National Standard Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
  - .1 ANSI/ASHRAE 52.2-12, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particulate Size (ANSI approved).
- .2 Canada Green Building Council (CaGBC)
  - .1 LEED Canada 2009 for Design and Construction, LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-115.10-M90, Disposable Air Filters for the Removal of Particulate Matter from Ventilating Systems.
  - .2 CAN/CGSB-115.14-M91, High Efficiency Cartridge Type Supported Air Filters for the Removal of Particulate Matter from Ventilating Systems.
  - .3 CAN/CGSB-115.15-M91, High Efficiency Rigid Type Air Filters for Removal of Particulate Matter from Ventilating Systems.
  - .4 CAN/CGSB-115.18-M85, Filter, Air, Extended Area Panel Type, Medium Efficiency.
  - .5 CAN/CGSB-115.20-95, Polarized Media Air Filter.
- .4 Underwriters' Laboratories of Canada (ULC)
  - .1 ULC -S111-07, Standard Method of Fire Tests for Air Filter Units.

1.2 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

- 1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)
- .2 Product Data: (Cont'd)
- .1 (Cont'd) characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Newfoundland and Labrador.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Sustainable Design Submittals:
- .1 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
- .2 Construction Waste Management:
- .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
- .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
- .3 Recycled Content:
- .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
- .4 Regional Materials: submit evidence that project incorporates required percentage 30 % of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
- 1.3 MAINTENANCE MATERIAL SUBMITTALS
- .1 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
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- 1.3 MAINTENANCE MATERIAL SUBMITTALS (Cont'd)
- .1 (Cont'd)
  - .2 (Cont'd)  
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.
- 1.4 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and 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 indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
    - .2 Store and protect HVAC filters from nicks, scratches, and blemishes.
    - .3 Replace defective or damaged materials with new.
  - .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.
  - .5 Packaging Waste Management: remove for reuse or return of pallets, crates, padding, banding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.
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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 indicated on drawings.
  - .3 Pressure drop when clean and dirty, sizes and thickness: as indicated on drawings.
- 2.2 ACCESSORIES
- .1 Holding frames: permanent channel section construction of same material as casing, 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.
- 2.3 FIBROUS GLASS PANEL FILTERS
- .1 Disposable fibrous glass media: to CAN/CGSB-115.10 with adhesive.
  - .2 Holding frame: 1.2 mm minimum thick galvanized steel with 3 mm diameter hinged wire mesh screen.
  - .3 Performance: minimum average synthetic dust weight arrestance 70% to ANSI/ASHRAE 52.2.
  - .4 Fire rated: to ULC -S111.
  - .5 Nominal thickness: 50 mm.
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- 2.4 COTTON PANEL FILTERS .1 Disposable pleated reinforced cotton dry media: to CAN/CGSB 115.18.
- .2 Holding frame: galvanized steel, or slide in channel for side access.
- .3 Performance:  
.1 Average atmospheric dust spot efficiency 30% to ANSI/ASHRAE 52.2.  
.2 Average synthetic dust weight arrestance 90% to ANSI/ASHRAE 52.2.
- .4 Fire rated: to ULC-S111.
- 2.5 CARTRIDGE TYPE FILTERS, 80-85% EFFICIENCY .1 Media: deep pleated, disposable, high efficiency, to CAN/CGSB-115.14.
- .2 Holding frame: galvanized steel with bracing.
- .3 Media support: welded wire grid.
- .4 Performance: average atmospheric dust spot efficiency 80-85% to ANSI/ASHRAE 52.2.
- .5 Fire rated: to ULC -S111.
- 2.6 CARTRIDGE TYPE FILTERS 95% EFFICIENCY .1 Media: disposable, high efficiency, to CAN/CGSB-115.15.
- .2 Holding frame: galvanized steel with bracing.
- .3 Media support: welded wire grid.
- .4 Performance: average atmospheric dust spot efficiency 95% to ANSI/ASHRAE 52.2.
- .5 Fire rated: to ULC-S111.
- 2.7 FILTER GAUGES - DIAL TYPE .1 Housing: die cast aluminum case and bezel, with acrylic cover. Exterior finish coated to withstand 168 hour salt spray corrosion test. Diaphragm actuated, direct reading.
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- 2.7 FILTER GAUGES .2 Accuracy:  $\pm 2\%$  of full scale ( $\pm 3\%$  on 0-125 PA, and  $\pm 4\%$  on 0-60PA), throughout range at 21.1°C.
- DIAL TYPE
- (Cont'd)
- .3 Pressure Limits: 500 mm Hg to 100 kPa.
- .4 Overpressure: Relief plug opens at approximately (1.72 kPa), standard.
- .5 Temperature Limits: 6.67 to 60°C.
- .6 Size: 101.6 mm diameter dial face.
- .7 Mounting Orientation: Diaphragm in vertical position.
- .8 Process Connections: 1 - 1/8 female NPT duplicate high and low pressure taps one pair side and one pair back.
- .9 Standard accessories: tow 1/8 NPT plugs for duplicate pressure taps, two 1/8 NPT pipe thread to rubber tubing adaptaters and three flush mounting adapters with screws.
- .10 Range: 0-250 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.
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- 3.2 INSTALLATION GENERAL .1 Install in accordance with manufacturer's recommendations and with adequate space for access, maintenance and replacement.
- 3.3 REPLACEMENT MEDIA .1 Replace media with new upon acceptance.  
.2 Filter media new and clean, as indicated by pressure gauge, at time of acceptance.
- 3.4 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.
- 3.5 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.  
.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.  
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.