

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).
- .2 Sheet Metal and Air Conditioning Contractor's National Association (SMACNA).
- .1 SMACNA HVAC Air Duct Leakage Test Manual, 1985.

### **1.2 SUBMITTALS**

- .1 Submit documents and samples required.
  - .2 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties. Include pressure test information and results as follows:
    - .1 Submit proposed report form and test report format to Departmental Representative for approval at least 1 month before proposed date of first series of tests. Do not start tests until approval received in writing from Departmental Representative.
    - .2 Prepare report of results and submit to Departmental Representative within 48 hours of completion of tests. Include:
      - .1 Schematic of entire system.
      - .2 Schematic of section under test showing test site.
      - .3 Required and achieved static pressures.
      - .4 Orifice differential pressure at test sites.
      - .5 Permissible and actual leakage flow rate (L/s) for test sites.
      - .6 Witnessed certification of results.
    - .3 Include test reports in final TAB report.
    - .4 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
    - .5 Instructions: Submit manufacturer's installation instructions.
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- .6 Manufacturer's field reports specified.

## **PART 2 - PRODUCTS**

### **2.1 TESTING INSTRUMENTS**

- .1 Test apparatus to include:
  - .1 Fan capable of producing required static pressure.
  - .2 Duct section with calibrated orifice plate mounted and accurately located pressure taps.
  - .3 Flow measuring instrument compatible with the orifice plate.
  - .4 Calibration curves for orifice plates used.
  - .5 Flexible duct for connecting to ductwork under test.
  - .6 Smoke bombs for visual inspections.
- .2 Test apparatus: Accurate to within  $\pm 3\%$  of flow rate and pressure.
- .3 Submit details of test instruments to be used to Departmental Representative at least 1 month before anticipated start date.
- .4 Test instruments: Calibrated and certificate of calibration deposited with Departmental Representative no more than 28 days before start of tests.
- .5 Re-calibrated every six months thereafter.

### **2.2 EQUIPMENT LEAKAGE TOLERANCES**

- .1 Equipment and system components such as VAV boxes, duct heating leakage: 1%.

## **PART 3 - EXECUTION**

### **3.1 TEST PROCEDURES**

- .1 Maximum lengths of ducts to be tested consistent with capacity of test equipment.
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- .2 Section of duct to be tested to include:
  - .1 Fittings, branch ducts, and tap-ins.
- .3 Repeat tests until specified pressures are attained. Bear costs for repairs and repetition to tests.
- .4 Base partial system leakage calculations on SMACNA HVAC Air Duct Leakage Test Manual.
- .5 Seal leaks that can be heard or felt, regardless of their contribution to total leakage.

### **3.2 SITE TOLERANCES**

- .1 System leakage tolerances specified are stated as percentage of total flow rate handled by system. Pro-rate specified system leakage tolerances. Leakage for sections of duct systems: Not to exceed total allowable leakage.
- .2 Leakage tests on following systems not to exceed specified leakage rates.
  - .1 Small duct systems up to 250 Pa: Leakage 2%.
  - .2 Large low pressure duct systems up to 500 Pa: Leakage 2%.
- .3 Evaluation of test results to use surface area of duct and pressure in duct as basic parameters.

### **3.3 TESTING**

- .1 Test ducts before installation of insulation or other forms of concealment.
- .2 Test after seals have cured.
- .3 Test when ambient temperature will not affect effectiveness of seals, and gaskets.

### **3.4 FIELD QUALITY CONTROL**

- .1 Quality Control
    - .1 Departmental Representative to witness tests and to verify reported results.
    - .2 To be certified by same TAB agency approved by Departmental Representative to undertake TAB on this project.
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### **3.5 CLEANING**

- .1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools, and equipment.

**END OF SECTION**

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