

Part 1 General**1.1 SUMMARY**

- .1 Section Includes:
 - .1 Materials and performance criteria for sound attenuation for mechanical systems.
- .2 Related Sections:
 - .1 Section 23 31 13.01 - Metal Ducts - Low Pressure to 500 Pa.
 - .2 Section 26 32 20 - Walk-In Enclosure .

1.2 REFERENCES

- .1 American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-05, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM C423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .3 ASTM E90-04, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .4 ASTM E477-99, Test Method for Measuring Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 National Building Code (NBC)-2010
- .5 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 00 10 - General Instructions. Include product characteristics, performance criteria, and limitations.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 00 10 - General Instructions.
 - .2 Provide separate shop drawings for each piece of attenuation equipment complete with product data.

1.4 PERFORMANCE REQUIREMENTS**.1 Rating Data:**

- .1 Provide performance rating data, certified by professional engineer or accredited test laboratory and supported by calculations and verified by test results in accordance with referenced standards as follows:
- .1 Silencer: insertion loss, pressure drop at design conditions.
 - .2 Acoustic plenums: transmission loss and acoustical absorption.
 - .3 Acoustical performance measurements in accordance with ASTM E477, ASTM E90 and ASTM C423, except where specified otherwise.

Part 2 Products**2.1 ABSORPTION AND INSULATING MEDIA**

- .1 Acoustic quality, glass fibre, bacteria and fungus resistant; free of corrosion causing or accelerating agents; packed to density to meet performance requirements; and meet NBC fire requirements or requirements of authority having jurisdiction for duct lining.

2.2 SILENCERS

- .1 Factory manufactured of prime coated or galvanized steel, compatible with ductwork specified elsewhere and to ASHRAE and SMACNA standards.
- .1 Outer casing and galvanized steel inner casing with clean cut circular perforations to enclose acoustic media. Inner casing to have half-splitters running full length of silencer where any cross sectional dimension exceeds 450mm. Protect media from erosion with glass fibre cloth between media and perforated metal.
- .1 Dimensions: to suit generator enclosure configuration..
 - .2 Capacity: to suit generator airflows.
 - .3 Pressure drop: 25 Pa.
 - .4 Insertion loss:

Insertion Loss (dB)						
63	125	250	500	1k	2k	4k
7	18	23	32	43	38	31

Part 3 Execution**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Noise flanking: where indicated, install in wall sleeve with uniform clearance around to ensure no contact of silencer with wall sleeve. Pack with flexible, non hardening caulking on both sides of sleeves.
- .2 Instrument test ports: install at inlet and outlet to permit measurement of insertion loss and pressure loss.
- .3 Suspension: to manufacturer's instructions.

3.3 FIELD QUALITY CONTROL

- .1 Testing:
 - .1 Experienced and competent sound and vibration testing professional engineer to take sound measurement after start up and testing.
 - .2 Sound measurements to extend over frequency range of 63 to 4k and taken:
 - .1 Upstream and downstream of each silencer.
 - .2 At following critical locations: property line.
 - .3 Provide Departmental Representative with notice 48 h in advance of commencement of tests.
 - .4 Establish adequacy of equipment isolation, acceptability of noise levels in occupied areas, other conditions affecting acoustics and, where appropriate, recommendation for remedial measures and costs.
 - .5 Submit complete report of test results.

3.4 CLEANING

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

END OF SECTION