

Power-Flow[®] Rectangular Silencers

CSI 3-Part Specifications | High Temperature Applications

Part 1 (General)

1.1 Section Includes

- A. Power-Flow duct sound attenuators

1.2 References

- A. ASTM E477 - American Society for Testing and Materials, Standard method of testing duct liner material and prefabricated silencers for acoustical and airflow performance.
- B. SMACNA — Sheet Metal & Air Conditioning Contractors' National Association
- C. NFPA 255 — National Fire Protection Association, testing of air conditioning and ventilation systems
- D. ASTM E84 — American Society for Testing and Materials, testing of air conditioning and ventilation systems
- E. UL-723 — Underwriters Laboratories, standard for safety; duct silencers

1.3 Submittal

- A. Comply with requirements of Section 01330 – Submittal Procedures
- B. Product Data: Submit manufacturer's product data
 1. Include dynamic insertion loss
 2. Include pressure drop data
 3. Verify conformance of ASTM E477, SMACNA, ASTM E84, NFPA 255, UL-723, and applicable building codes.
 4. Verify silencer dynamic insertion loss and pressure drop ratings based on tests performed at certified NVLAP-accredited laboratory in accordance with ASTM E477.

1.4 Quality Assurance

- A. Silencers to be tested NVLAP-accredited laboratory. Data from non-accredited laboratories will not be accepted. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves, and test chamber sound absorption are eliminated.
- B. Dynamic Insertion Loss: Silencer dynamic insertion loss performance shall be the results of NVLAP-laboratory test performed in accordance with ASTM E477.
- C. Pressure Drop: Silencer pressure drop performance shall be the results of NVLAP-laboratory test performed in accordance with ASTM E477.

1.5 Delivery, Storage & Handling

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging (when applicable), with labels clearly indicating manufacturer and material.
- B. Storage: Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions
- C. Handling: Handle and lift silencers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

Part 2 (Products)

2.1 Manufacturer

- A. IAC Acoustics, 50 Shuman Boulevard Suite 201, Naperville, IL 60563, United States
Phone: 630-270-1790 Fax: 630-966-9710

2.2 Duct Silencers

- A. Fabrication
 1. Model: IAC Quiet-Duct[®] Power-Flow Rectangular silencers (High Temp). Models PL, PLFL, PLFM, PLFS, PML, PMS, PS. Silencers shall be fabricated of **all welded construction**. All materials used in the silencer must be free of rust, weld splatter, mill scale, or other foreign matter.
 2. Outer Casing: Outer shell material shall be a minimum of 11 gauge (13 mm) **Hot Rolled Steel** or **304 Stainless Steel**. Shell shall be adequately stiffened to minimize vibration and to support the internal acoustical elements. Flanging shall be 3 x 3 x ¼" (75 mm x 75 mm x 6 mm) structural angle or heavier. The outer shell shall be prepared for painting by removal of all foreign matter by means of wire brush or blast cleaning and shall be given a prime coat of paint to a thickness of not less than 5 mils (0.13 mm).
 3. Internal Liner: 11 gauge perforated **High-Temp Galvanized Steel** or **304 Stainless Steel** internal liner. Silencer acoustical elements shall be constructed of 18 gauge (1.3 mm) galvanized steel. Perforated materials shall be not less than 23% open area.

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CSI 3-Part Specifications

4. **Baffle Fill:** Sound absorptive materials shall be of inorganic mineral or glass fiber of a density sufficient to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Materials shall be inert, vermin and moisture-proof, and protected with a glass fiber cloth.
5. **Baffle Attachment:** Attachment of the interior baffle partitions to the casing shall be by means of interlocking track assembly. Tracks shall be galvanized steel and shall be welded to the outer casing. Attachment of the interior baffle partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location. The track assembly shall stiffen the exterior casing, provide a reinforcement attachment detail for the interior baffle partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and acoustic performance. Interior baffle partitions shall be additionally secured to the outer casing with welded nose clips at both ends of the sound attenuator.
6. **Construction:** Silencers shall be fabricated of all welded construction. All materials used in the silencer must be free of rust, weld splatter, mill scale, or other foreign matter. Sound attenuators capable of withstanding a differential air pressure of 8" w.g.
7. **Assembly:** Factory shall assemble silencer and/or individual silencer modules and/or accessories prior to shipment.

B. Performance Data

1. Based on testing a 24" x 24 (minimum) size unit.
2. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477. The test facility shall be NVLAP accredited for the ASTM E477 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity.
3. Aerodynamic performance data is obtained from laboratory testing in accordance with ASTM E477 testing procedure. Data shall be presented for the same units as those tested to ascertain acoustical performance data.

4. Fire and smoke performance data derived from testing in accordance with ASTM E84, NFPA 255, and UL-723 testing methods. Incombustible filler material exhibits the following fire hazard classification values:

FLAMESPREAD CLASSIFICATION — 25
SMOKE DEVELOPED RATING — 50

2.3 Accessories

- A. **Acoustic Fill Lining:** When required, acoustic fill can be encapsulated with polymeric film to prevent erosion of acoustic fill and/or particulate getting into the airstream.
- B. **Capped Ends:** Silencers can be manufactured with capped ends to prevent contamination during delivery to job site and at job site.

Part 3 (Execution)

3.1 Examination

- A. Inspect areas to receive sound attenuators. Notify the Engineer of conditions that would adversely affect the installation or subsequent utilization of the silencers. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 Installation

- A. Install sound attenuators at locations indicated on the drawings and in accordance with manufacturer's installation instructions.
- B. If duct transitions are required to adapt silencer dimensions to installed ductwork dimensions, the contractor shall provide the required hardware and labor.