

Quiet-Duct Ultra™ / ZAPD Silencers

Section 15000 Specifications

1.01 General

- A. Furnish and install "Quiet-Duct Ultra™/ZAPD" (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of IAC Acoustics. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 Materials

- A. Outer casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:

| | |
|----------------------------------|----|
| Flamespread Classification | 20 |
| Smoke Development Rating..... | 20 |

3.01 Construction

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 Acoustic Performance

- A. 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 E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 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. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:

Rectangular, inch: 24 x 24, 24 x 30, or 24 x 36

5.01 Aerodynamic Performance

- A. IAC Quiet-Duct Ultra™ /ZAPD silencers do not introduce any additional pressure drop into the system.

6.01 Certification

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

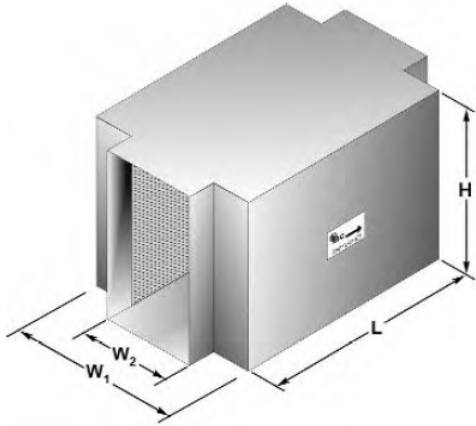
7.01 Duct Transitions

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.

Quiet-Duct Ultra™ / ZAPD Silencers

Type: Z12D

Forward & Reverse Flow Ratings



Designating Silencers

Model: 5Z12D 6x12

Type: Z12D **Length:** 5' **W₂:** 12" **Height:** 12"

All Z12D Silencers W₁ = 48"

This specific line of silencers has been designed for applications in which acoustics attenuation is required and no allowance can be made for pressure drop loss. A Zero Added Pressure Drop silencer is ideal for high velocity systems or systems that have little or no room for additional pressure drop. The IAC Quiet-Duct ZAPD series of silencers do not create any additional pressure drop in the system and have negligible Self-Noise Sound Power Levels. All Quiet-Duct Ultra™/ZAPD silencers have been rated with procedures certified in strict accordance with ASTM E477-99 in IAC's NVLAP Accredited Acoustical Laboratory.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels. The Z12D has a 12" wide opening and two 18" baffles on each side, having a combined total width of 48", for effective acoustic attenuation. All ZAPD silencers have been rated with procedures certified in strict accordance with ASTM E477-99 in IAC's NVLAP Accredited Acoustical Laboratory.

Table I: Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length (ft) | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------|--------------------|----------------------------|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | Dynamic Insertion Loss, dB | | | | | | | |
| 3 | -2000 | 5 | 8 | 10 | 10 | 11 | 5 | 3 | 4 |
| | -1000 | 5 | 8 | 10 | 10 | 10 | 5 | 4 | 3 |
| | 0 | 5 | 8 | 10 | 10 | 9 | 4 | 3 | 3 |
| | 1000 | 4 | 8 | 10 | 10 | 9 | 4 | 3 | 2 |
| | 2000 | 4 | 8 | 10 | 10 | 9 | 4 | 3 | 2 |
| 5 | -2000 | 8 | 15 | 18 | 18 | 18 | 9 | 6 | 7 |
| | -1000 | 8 | 15 | 18 | 17 | 18 | 9 | 6 | 7 |
| | 0 | 8 | 14 | 18 | 17 | 18 | 8 | 6 | 6 |
| | 1000 | 8 | 14 | 18 | 17 | 19 | 8 | 5 | 5 |
| | 2000 | 7 | 14 | 17 | 17 | 19 | 8 | 5 | 5 |
| 7 | -2000 | 11 | 21 | 26 | 25 | 26 | 12 | 8 | 10 |
| | -1000 | 11 | 21 | 26 | 25 | 26 | 12 | 9 | 10 |
| | 0 | 11 | 21 | 25 | 25 | 25 | 11 | 8 | 8 |
| | 1000 | 11 | 20 | 25 | 25 | 24 | 11 | 7 | 7 |
| | 2000 | 10 | 20 | 25 | 25 | 25 | 11 | 7 | 7 |
| 10 | -2000 | 16 | 29 | 35 | 34 | 36 | 17 | 12 | 13 |
| | -1000 | 16 | 29 | 35 | 34 | 35 | 16 | 12 | 13 |
| | 0 | 15 | 28 | 34 | 34 | 34 | 15 | 11 | 11 |
| | 1000 | 15 | 28 | 34 | 33 | 33 | 14 | 10 | 9 |
| | 2000 | 15 | 27 | 34 | 33 | 34 | 14 | 10 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.