*Intelligent Acoustic Solutions*

Sound Attenuator

# SPEC DATA SHEET # No. 778-11

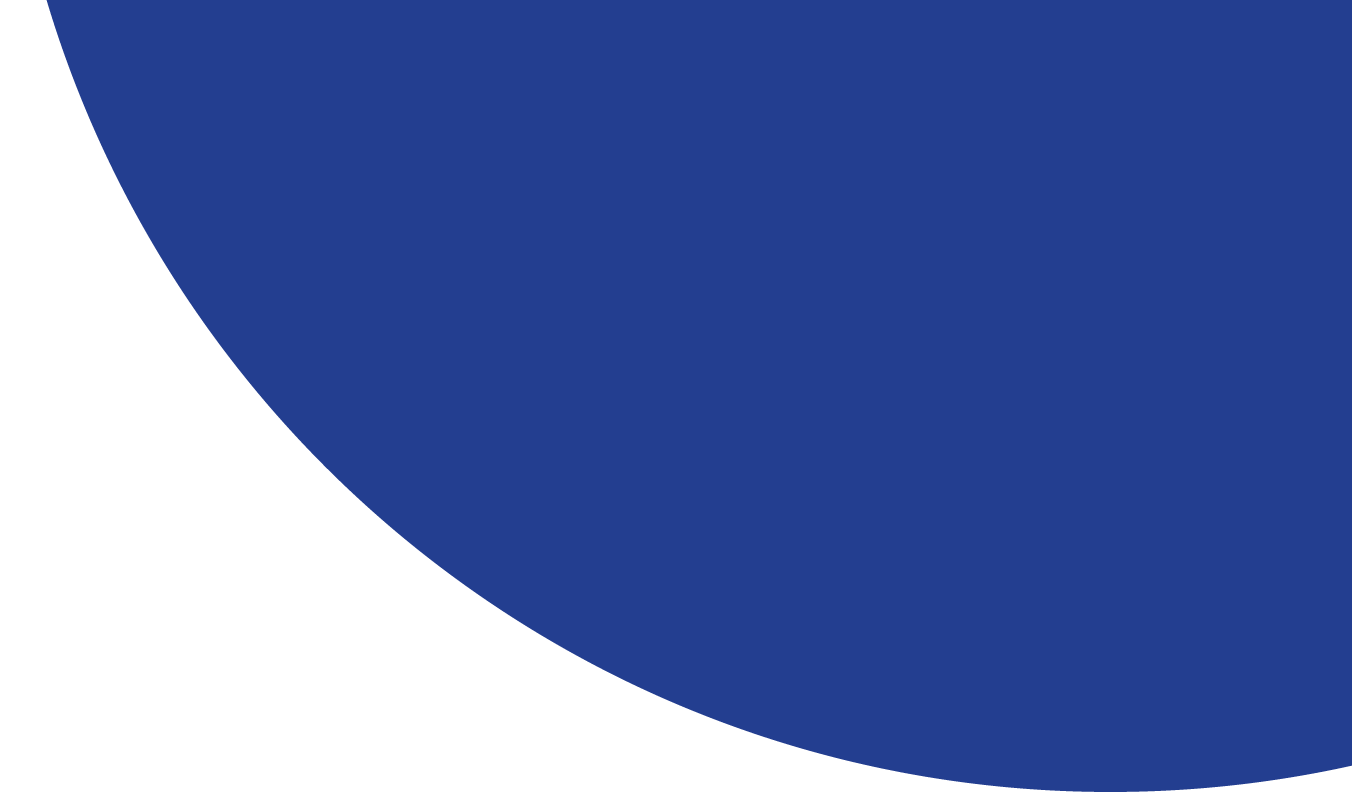
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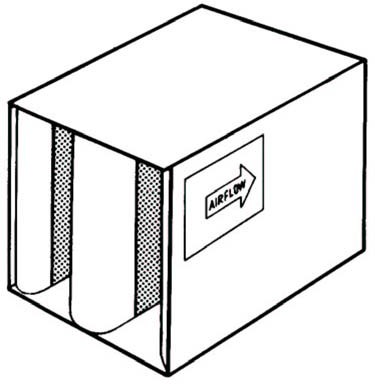
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ENGINEERING DATA SHEET

Supersedes No. 778-95



**MODEL HPA**



H

L

W

RECTANGULAR

**NOMENCLATURE EXAMPLE:**

WIDTH HEIGHT LENGTH MODEL

# 24 24 36 HPA

Commercial Acoustics sound attenuators are engineered to achieve a maximum insertion loss and a minimum pressure drop. Commercial Acoustics sound attenuators feature airfoil design for efficient aerodynamic performance. Galvanized steel construction and an absorbent, inorganic mineral glass fiber acoustical fill; guarantee excellent reliability and perfor-mance.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MODEL NO.** | **OCTAVE BANDS** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| **CENTER FREQUENCY (Hz)** | **63** | **125** | **250** | **500** | **1000** | **2000** | **4000** | **8000** |
| **FACE VELOCITY, fpm** | **DYNAMIC INSERTION LOSS IN DECIBELS (dB)** | | | | | | | |
|  | -2000 | 8 | 13 | 22 | 30 | 37 | 34 | 23 | 13 |
|  | -1000 | 6 | 12 | 16 | 31 | 37 | 32 | 27 | 14 |
| **3HPA** | 0 | 5 | 11 | 15 | 29 | 37 | 34 | 27 | 15 |
|  | +1000 | 6 | 11 | 15 | 26 | 36 | 36 | 27 | 17 |
|  | +2000 | 6 | 10 | 16 | 26 | 33 | 34 | 29 | 18 |
|  | -2000 | 12 | 23 | 26 | 43 | 49 | 43 | 36 | 23 |
|  | -1000 | 12 | 20 | 23 | 42 | 48 | 45 | 38 | 21 |
| **5HPA** | 0 | 11 | 18 | 24 | 41 | 47 | 45 | 39 | 23 |
|  | +1000 | 9 | 17 | 25 | 39 | 46 | 45 | 40 | 25 |
|  | +2000 | 8 | 15 | 21 | 38 | 44 | 45 | 40 | 27 |
|  | -2000 | 13 | 25 | 37 | 47 | 52 | 45 | 41 | 31 |
|  | -1000 | 12 | 24 | 36 | 47 | 52 | 49 | 43 | 31 |
| **7HPA** | 0 | 11 | 22 | 35 | 46 | 52 | 48 | 44 | 32 |
|  | +1000 | 11 | 21 | 34 | 44 | 52 | 47 | 44 | 33 |
|  | +2000 | 9 | 16 | 35 | 46 | 48 | 49 | 46 | 34 |
|  | -2000 | 12 | 26 | 44 | 53 | 54 | 53 | 48 | 41 |
|  | -1000 | 12 | 25 | 43 | 53 | 56 | 52 | 50 | 42 |
| **10HPA** | 0 | 13 | 24 | 43 | 52 | 55 | 53 | 50 | 44 |
|  | +1000 | 13 | 24 | 43 | 51 | 54 | 54 | 50 | 46 |
|  | +2000 | 13 | 17 | 42 | 51 | 54 | 52 | 50 | 47 |

THIS TABLE CONTAINS BOTH FORWARD(+) AND REVERSE(-) FLOW ACOUSTIC AND AERODYNAMIC RATINGS BASED ON COMPARATIVE TEST RESULTS MEASURED IN ACCORDANCE WITH APPLICABLE PORTIONS OF ASTM E477. COPIES OF CERTAIN TEST REPORTS CAN BE FURNISHED UPON REQUEST.



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ENGINEERING DATA

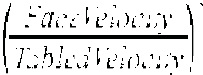
# RECTANGULAR MODEL HPA

**AIR FLOW RATINGS FOR THE 12 x 12 SIZE, SHADED, REPRESENTS BOTH CFM AND FACE VELOCITY IN fpm. USE THIS TO GET THE RATING FOR SILENCER SIZES NOT SHOWN AND FOR MULTIPULE MODULE SILENCER BANKS.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MODEL** | **3HPA** | 0.06 | 0.09 | 0.16 | 0.21 | 0.26 | 0.29 | 0.39 | 0.51 | 0.59 | 0.74 | 0.99 | 1.24 |
| **5HPA** | 0.06 | 0.10 | 0.16 | 0.23 | 0.27 | 0.32 | 0.43 | 0.56 | 0.67 | 0.84 | 1.09 | 1.37 |
| **7HPA** | 0.07 | 0.12 | 0.17 | 0.25 | 0.31 | 0.37 | 0.47 | 0.61 | 0.73 | 0.91 | 1.19 | 1.51 |
| **10HPA** | 0.08 | 0.14 | 0.21 | 0.28 | 0.35 | 0.41 | 0.55 | 0.67 | 0.81 | 0.99 | 1.37 | 1.71 |
| **SIZE**  **W x H** | **Face**  **Area** | **AIR FLOW IN CFM** | | | | | | | | | | | |
| 6 x 12 | 0.5 | 227 | 297 | 354 | 402 | 438 | 465 | 500 | 569 | 630 | 743 | 858 | 959 |
| 6 x 24 | 1 | 454 | 594 | 707 | 804 | 875 | 930 | 1000 | 1138 | 1260 | 1485 | 1715 | 1917 |
| 6 x 36 | 1.5 | 681 | 891 | 1061 | 1206 | 1313 | 1395 | 1500 | 1707 | 1890 | 2228 | 2573 | 2876 |
| 12 x 12 | 1 | 454 | 594 | 707 | 804 | 875 | 930 | 1000 | 1138 | 1260 | 1485 | 1715 | 1917 |
| 12 x 24 | 2 | 908 | 1188 | 1414 | 1608 | 1750 | 1860 | 2000 | 2276 | 2520 | 2970 | 3430 | 3834 |
| 12 x 36 | 3 | 1362 | 1782 | 2121 | 2412 | 2625 | 2790 | 3000 | 3414 | 3780 | 4455 | 5145 | 5751 |
| 18 x 12 | 1.5 | 681 | 891 | 1061 | 1206 | 1313 | 1395 | 1500 | 1707 | 1890 | 2228 | 2573 | 2876 |
| 18 x 18 | 2.25 | 1022 | 1337 | 1591 | 1809 | 1969 | 2093 | 2250 | 2561 | 2835 | 3341 | 3859 | 4313 |
| 18 x 30 | 3.75 | 1703 | 2228 | 2651 | 3015 | 3281 | 3488 | 3750 | 4268 | 4725 | 5569 | 6431 | 7189 |
| 18 x 36 | 4.5 | 2043 | 2673 | 3182 | 3618 | 3938 | 4185 | 4500 | 5121 | 5670 | 6683 | 7718 | 8627 |
| 18 x 48 | 6 | 2724 | 3564 | 4242 | 4824 | 5250 | 5580 | 6000 | 6828 | 7560 | 8910 | 10290 | 11502 |
| 24 x 24 | 4 | 1816 | 2376 | 2828 | 3216 | 3500 | 3720 | 4000 | 4552 | 5040 | 5940 | 6860 | 7668 |
| 24 x 36 | 6 | 2724 | 3564 | 4242 | 4824 | 5250 | 5580 | 6000 | 6828 | 7560 | 8910 | 10290 | 11502 |
| 24 x 48 | 8 | 3632 | 4752 | 5656 | 6432 | 7000 | 7440 | 8000 | 9104 | 10080 | 11880 | 13720 | 15336 |
| 30 x 24 | 5 | 2270 | 2970 | 3535 | 4020 | 4375 | 4650 | 5000 | 5690 | 6300 | 7425 | 8575 | 9585 |
| 30 x 36 | 7.5 | 3405 | 4455 | 5303 | 6030 | 6563 | 6975 | 7500 | 8535 | 9450 | 11138 | 12863 | 14378 |
| 30 x 48 | 10 | 4540 | 5940 | 7070 | 8040 | 8750 | 9300 | 10000 | 11380 | 12600 | 14850 | 17150 | 19170 |
| 36 x 36 | 9 | 4086 | 5346 | 6363 | 7236 | 7875 | 8370 | 9000 | 10242 | 11340 | 13365 | 15435 | 17253 |
| 36 x 42 | 10.5 | 4767 | 6237 | 7424 | 8442 | 9188 | 9765 | 10500 | 11949 | 13230 | 15593 | 18008 | 20129 |
| 36 x 48 | 12 | 5448 | 7128 | 8484 | 9648 | 10500 | 11160 | 12000 | 13656 | 15120 | 17820 | 20580 | 23004 |

**Helpful Equations:** Face Area = (Width in inches ×

Height in inches) ÷ 144 Face Velocity = CFM ÷ Face Area in Sq.Ft.

Silencer S.P. Loss =  **X** Tabled S.P. Loss

## STANDARD CONSTRUCTION FEATURES

Outer Casing – Solid 22GA G90 galvanized steel

Inner Partitions – Perforated 22GA G90 galvanized steel Acoustical Fill – Inorganic mineral glass fiber meeting NFPA 90A, UL 723, and ASTM E84 of sufficient density and packed under at least 5% compression to eliminate voids and to obtain cataloged ratings

Maximum Differential Pressure – 8 in. wc. as tested in accord-ance with UL 181, Section 17

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Octave Band | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Frequency, Hz | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Length | Face Velocity | **Self-Generated Sound Power Ratings (PWL) dB re 10-12 WATTS** | | | | | | | |
|  | +200073 | 70 | | 62 | 64 | 60 | 62 | 62 | 57 |
| **ALL** | +100054 | 48 | | 50 | 48 | 45 | 48 | 43 | 33 |
| **LENGTHS** | -100055 | 50 | | 51 | 51 | 54 | 57 | 51 | 39 |
|  | -200067 | 61 | | 62 | 67 | 60 | 63 | 67 | 65 |

## When adding any two decibel levels together to an accuracy of 1 dB

|  |  |
| --- | --- |
| Difference between two  dB levels | Add to the higher dB  level |
| 0 or 1 dB | 3 dB |
| 2 or 3 dB | 2 dB |
| 4 to 9 dB | 1 dB |
| 10 dB or more | 0 dB |

Air flow ratings shown include static regain. Therefore, if silencers are installed immediately before or after elbows, transitions, at the intake or discharge of the system, or with-out duct, allowance to compensate for such conditions must be included when calculating the operating static pressure loss across the silencer. Failure to make allowanc-es for these conditions can add several velocity heads to the static pressure loss of the system. All acoustic and aero-dynamic performance obtained on a 24” x 24” cross sec-tion production unit.

**Self-Generated Sound Power, Face Area Adjustment Factors**



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|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Face Area | 0.50 | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 |
| Adjustment Factor, dB | -9 | -6 | -3 | 0 | +3 | +6 | +9 | +12 | +15 |