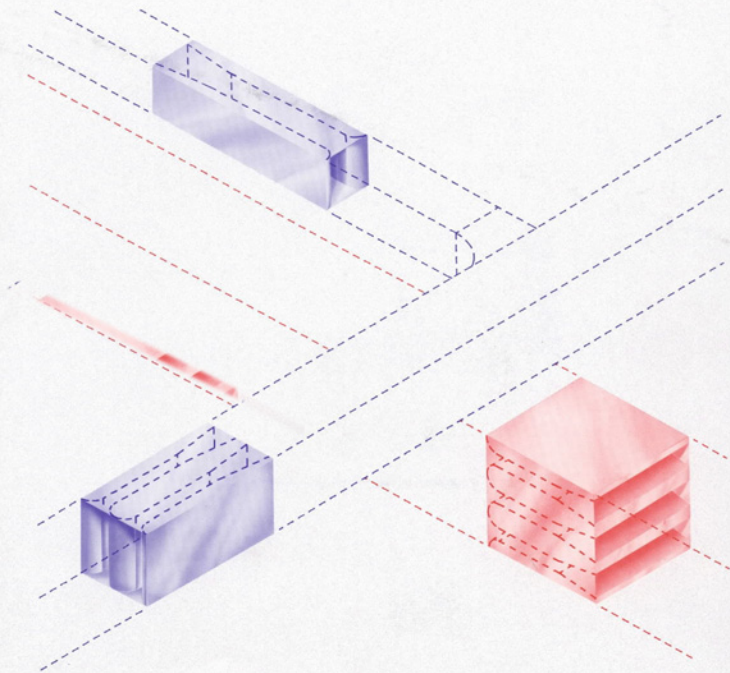


RECTANGULAR DUCT SILENCERS ULTRA LOW FRICTION — AEROFOIL DESIGN

PERFORMANCE CERTIFIED IN ACCORDANCE WITH ASTM—E477 TEST STANDARD



1-800-VIA-AERO
(842-2376)



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In The U.S.A.

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SILENCING HVAC FAN NOISE

The fans that move the air through modern HVAC systems are noise generators. The ductwork carrying the conditioned air to the occupied spaces in the building acts as the old fashioned "speaking tubes" to also conduct the fan noise to the occupied spaces. This can result in annoying or intolerable noise levels in offices, conference rooms, auditoriums, etc.

The solution is to place one or more silencers between the fan and the occupied spaces. See bulletin B-119 for the DAAS system for determining if a silencer is needed and if so, the model and size.

Since tap-offs to different offices from a common duct also transmit noise and conversations from one room to another, silencers are also used in the branch ducts to insure office privacy.

Duct silencers are available in a wide assortment of geometries, models, and lengths. This is to accommodate duct shape, pressure loss vs air flow and noise reduction. The table below lists the *Silentflow*[®] duct silencer models and their general characteristics.

Each of the tabulated silencer models is available in four standard lengths: 3 ft., 5 ft., 7 ft. and 10 ft. Longer lengths of rectangular silencers of a given model increase the noise reduction and slightly increase the pressure drop. Rectangular silencers of a given model and length retain their noise reduction regardless of their cross-section.

AEROACOUSTIC Corporation emphasizes the proper and secure seal between duct to silencer and silencer to duct with an approved non-toxic high pressure duct sealant. When subjected to laboratory test block conditions, connections that were not "air-tight" have resulted in a loss of attenuation in an overall acoustical performance of 5 to 7 decibels due to the "flanking transmission" phenomenon.

GENERAL ACOUSTIC AND PRESSURE DROP PERFORMANCE

MODEL	MODULE SIZE	PRESSURE DROP	CFM/FT ² @ 1" H ₂ O ΔP	OVERALL ACOUSTIC PERFORMANCE	LOW FREQUENCY ACOUSTIC PERFORMANCE	HIGH FREQUENCY ACOUSTIC PERFORMANCE
Y	6", 12" or 24"	NORMAL	1730	EXCELLENT	VERY GOOD	EXCELLENT
YY	12" or 24"	NORMAL	1730	VERY GOOD	EXCELLENT	VERY GOOD
W	7½", 15" or 30"	LOW	3354	VERY GOOD	VERY GOOD	VERY GOOD
WW	15" or 30"	LOW	3354	VERY GOOD	VERY GOOD	GOOD
V	6", 12" or 24"	LOW	2475	VERY GOOD	VERY GOOD	VERY GOOD
VV	12" or 24"	LOW	2475	VERY GOOD	VERY GOOD	VERY GOOD
Z	6", 12" or 24"	ULTRA LOW	4600	GOOD	GOOD	GOOD
ZZ	12" or 24"	ULTRA LOW	4600	GOOD	GOOD	GOOD
X	9", 18" or 36"	ULTRA LOW	4600	GOOD	GOOD	GOOD

Silentflow®

DUCT SILENCER CONSTRUCTION

- The silencer shell is constructed of 22 to 18 gauge galvanized steel for superior strength and maximum sound transmission reduction through the side walls. No flimsy 26 or 24 gauge material that vibrates in the airstream.
- All acoustical fill is Owens Corning 702/703 unfaced, resin-bonded, waterproof and erosion resistant fiberglass. No dust laden and water absorbing mineral wool or felt is used. The combustion ratings of the fiberglass is as follows:
 - Flame Spread Classification = 15
 - Smoke Development Rating = 0
- All internals are electric resistance welded under quality controlled factory conditions for an outstandingly long life. No screws or clips are used which could come loose in shipment or vibrate loose in the airstream.
- Every air path is aerodynamically designed and built with a static pressure regain diffuser, not the standard straight air path construction. Also, in the larger modules, a structural air path support is factory installed to prevent lateral compression.
- Our acoustically designed perforated sheet pattern (overall percent of free area - bar size - number of holes per sq. in.) is formulated from maximum sound transparency index (TI) calculations and extensive laboratory test results for specific frequency attenuation.

AVAILABLE OPTIONAL ACCESSORIES

- Mylar protective wrapping over the acoustical fill for use in oil or dust laden environment. The protective film prevents wicking and contamination of the acoustical fill.
- All stainless steel construction, Type 304 or Type 316, for the chemical, pharmaceutical and food industry. With the addition of Mylar Protective Film, these silencers can be used in clean room applications. These silencers are completely serviceable for high pressure water jet cleaning and drip dry with no loss of acoustical attenuation.
- Removable internal batt construction for abnormally dirty applications, i.e. auto body shops, wood shops, metal grinder exhausts, etc. Batts can be vacuumed, submerged for cleaning or replaced with new batts depending upon application.
- Flanged connections, flexible connections, slip connections, hanger cradles can be factory provided for ease of field installation.
- Inlet and/or discharge transitions or fittings are available from the factory for proper fit.
- Bird screens and rainhoods, both vertical and horizontal, for outside applications.
- Factory installed filter assemblies before or after the silencer.

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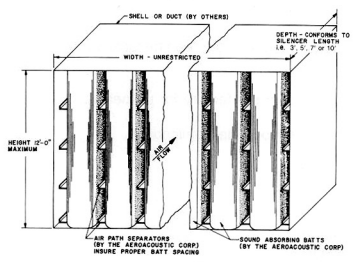
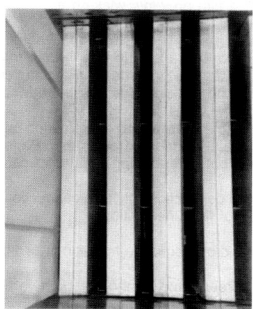
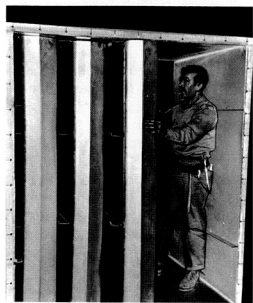
THE KD (KNOCKED DOWN) CONCEPT

When very large silencers are required, such as for fresh air intakes, fan plenum discharges and in ducts larger than the maximum modular size, the AEROACOUSTIC Corp. can supply the silencer internals for installation in ductwork or openings by others. The KD silencer kit consists of the proper number and length of sound absorbing batts plus the spacers and assembly instructions. They are the same batts and spacers from which the factory-assembled complete silencers are fabricated.

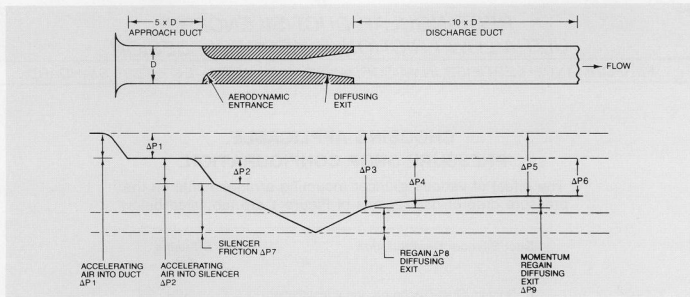
Field tests have shown that assembling a large silencer from a KD kit requires fewer manhours than banding together the modules to form the larger unit. Both initial and shipping costs are lower for the KD kit.

Silencers field assembled in accordance with the assembly instructions and with the supplied sound absorbing batts and spacers are guaranteed by AEROACOUSTIC Corp. to have the same certified performance tabulated for complete silencers.

KD internals can be supplied for silencers having heights of up to 12 feet and any width, per the accompanying sketch.



DUCT SILENCER AERODYNAMICS & AEROMECHANICS



The tabulated pressure drop, dynamic insertion loss and self-generated noise are based upon tests conducted at an independent testing laboratory. The test reverberation room is qualified in accordance with ANSI S1.31 and ANSI S1.32 for sound measurements from 100 to 10,000 hertz. The laboratory method used in conducting the test is in accordance with ASTM Standard E477-90 "Standard Method of Testing Duct Liner Materials and Prefabricated Silencers for Acoustical and Airflow Performance".

The published dynamic insertion loss ratings are tabulated for both positive and negative silencer face velocities. Positive (blue) velocities apply when the air and the noise are moving in the same direction, e.g., a silencer on the discharge side of the fan. Negative (red) velocities apply when the air and the noise are moving in the opposite direction, e.g., a silencer on the intake side of the fan.

The published pressure drop (ΔP) vs flow data for *Silentflow*[®] and other AEROACOUSTIC duct silencers is based on the ideal installation, i.e. in a straight run of ductwork with at least 5 equivalent duct diameters upstream of the silencer entrance and 10 equivalent diameters downstream of the silencer exit. While we recommend mounting duct silencers in this fashion, this is seldom achieved in practice.

The purpose of the following pages is to explain what happens if the above ideal installation is not used. A sketch of an ideal installation and the contribution of various parts of the air path to the pressure drop are shown in Figure 1. This figure shows the contribution to the overall static pressure drop of the various portions of the flow path, as follows:

- $\Delta P1$ is the drop in static pressure required to accelerate atmospheric air into the duct.
- $\Delta P2$ is the drop in static pressure required to accelerate the air from the duct velocity to the velocity in the silencer flow path.
- $\Delta P7$ is the friction pressure drop within the silencer flow path.
- $\Delta P8$ is the pressure rise due to flow deceleration in the diffusing exit of the silencer flow path.
- $\Delta P9$ is the momentum regained from the exit velocity from the silencer diffusing exit - a straight run of at least 10 equivalent duct diameters downstream of the silencer is required in order to achieve this regain.

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CHOOSING APPLICABLE PRESSURE DROP CONFIGURATION.

The effect of various silencer mounting arrangements on the pressure drop or rise regions of Figure 1 are tabulated below

Duct Silencer Configuration	Diffusing Exit
A. Duct-in, Duct-Discharge, Ideal Installation	ΔP_6
B. Bellmouth in, free discharge, wall mounted silencer	ΔP_3
C. Bellmouth in, duct-discharge, inlet silencer	ΔP_5
D. Duct-in, free discharge, discharge silencer	ΔP_4

AEROACOUSTIC silencers all incorporate diffusing exits and the ΔP for diffusing exits should be used with these silencers.

We have tabulated flow vs ΔP for arrangements A, B, C and D for AEROACOUSTIC duct silencers in terms of CFM/FT² at $\Delta P = 1.0''\text{H}_2\text{O}$ in bulletin B-433.

Pressure drop at other than tabulated flow can be

$$\Delta P_{\text{actual}} = \Delta P_{\text{tabulated}} \times \left[\frac{Q_{\text{actual}}}{Q_{\text{tabulated}}} \right]^2 \times \frac{\rho}{.076}$$

Flow at other than the tabulated ΔP can be calculated by

$$Q_{\text{actual}} = Q_{\text{tabulated}} \times \left[\frac{\Delta P_{\text{actual}} \times .076}{\Delta P_{\text{tabulated}} \times \rho} \right]^{1/2}$$

EFFECTS OF TYPICAL INSTALLATIONS ON SILENCER PRESSURE DROP



FIG. 1A DUCT IN, DUCT DISCHARGE (A) ΔP_6

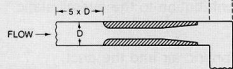


FIG. 2 DUCT IN, FREE DISCHARGE (D) ΔP_4

Note—Velocity at "Tee" or "Elbow" will be 2 to 4 times average duct velocity.

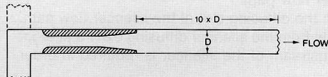


FIG. 3 ELBOW ON TEE INLET, DUCT DISCHARGE (A) ΔP_6 + ALLOWANCE FOR BAD INLET FLOW.

Note—Silencer flow passages should be rotated 90° from the above sketch.

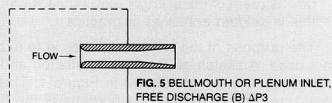


FIG. 5 BELLMOUTH OR PLENUM INLET, FREE DISCHARGE (B) ΔP_3

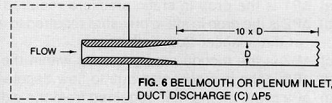


FIG. 6 BELLMOUTH OR PLENUM INLET, DUCT DISCHARGE (C) ΔP_5

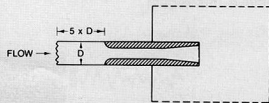


FIG. 7 DUCT INLET, PLENUM OR FREE DISCHARGE (D) ΔP_4

FOR SILENCERS IN NON-IDEAL INSTALLATION

MODEL	MAXIMUM ALLOWABLE CFM/ft. ²	DUCT INLET DUCT DISCHARGE		BELLMOUTH INLET DUCT DISCHARGE		DUCT INLET FREE DISCHARGE		BELLMOUTH INLET FREE DISCHARGE	
		½" H ₂ O CFM/ft. ²	1" H ₂ O CFM/ft. ²	½" H ₂ O CFM/ft. ²	1" H ₂ O CFM/ft. ²	½" H ₂ O CFM/ft. ²	1" H ₂ O CFM/ft. ²	½" H ₂ O CFM/ft. ²	1" H ₂ O CFM/ft. ²
V-3	2200	1750	*2475	1485	2100	1403	1984	1255	1774
V-5	2200	1591	*2250	1384	1957	1317	1862	1192	1686
V-7	2200	1468	2077	1301	1840	1245	1760	1138	1609
V-10	2200	1328	1879	1200	1698	1156	1635	1069	1511
VV-3	2200	1750	*2475	1433	2026	1230	1740	1127	1593
VV-5	2200	1591	*2250	1385	1958	1200	1697	1103	1560
VV-7	2200	1468	2077	1341	1897	1171	1656	1081	1528
VV-10	2200	1328	1879	1283	1815	1132	1601	1050	1484
W-3	2700	2372	*3354	1739	2459	1637	2315	1414	2000
W-5	2700	2205	*3119	1661	2349	1572	2223	1371	1939
W-7	2700	2070	*2928	1593	2252	1513	2140	1332	1883
W-10	2700	1907	2697	1504	2127	1437	2032	1279	1809
WW-3	2700	2372	*3354	1673	2365	1436	2031	1278	1808
WW-5	2700	2205	*3119	1637	2314	1413	1999	1262	1785
WW-7	2700	2070	*2928	1603	2267	1392	1968	1247	1763
WW-10	2700	1907	2697	1556	2200	1360	1924	1224	1731
X-3	3300	3253	*4600	2062	2916	2062	2916	1661	2349
X-5	3300	3067	*4338	2005	2835	2005	2835	1631	2306
X-7	3300	2910	*4115	1952	2761	1952	2761	1602	2266
X-10	3300	2712	*3836	1881	2660	1881	2660	1562	2209
Y-3	1650	1224	*1730	1121	1586	1041	1473	976	1381
Y-5	1650	1097	1552	1022	1445	960	1358	908	1284
Y-7	1650	1003	1419	945	1336	895	1266	853	1206
Y-10	1650	899	1271	856	1211	819	1158	786	1111
YY-3	1650	1224	*1730	1080	1528	931	1317	884	1250
YY-5	1650	1097	1552	1032	1460	900	1273	857	1212
YY-7	1650	1003	1419	990	1401	872	1233	832	1177
YY-10	1650	899	1271	936	1324	834	1179	799	1130
Z-3	3300	3253	*4600	2061	2915	2276	3219	1767	2499
Z-5	3300	2984	*4220	1977	2797	2165	3062	1714	2424
Z-7	3300	2773	*3922	1903	2692	2069	2926	1665	2354
Z-10	3300	2526	*3573	1806	2554	1946	2751	1599	2261
ZZ-3	3300	3253	*4600	2046	2893	1945	2750	1598	2260
ZZ-5	3300	2984	*4220	2003	2833	1908	2699	1578	2231
ZZ-7	3300	2773	*3922	1964	2777	1874	2650	1558	2204
ZZ-10	3300	2526	*3573	1908	2699	1826	2582	1530	2164

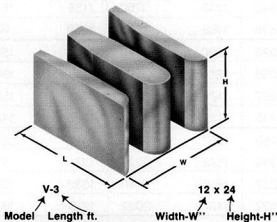
*These velocities exceed the maximum allowable velocities for trouble free service and are tabulated as an indication of the performance of the silencers at 1" ΔP

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(Duct silencer is shown without shell so as to illustrate the internal configuration.)



Models V & VV

Model V is specifically designed to address the 500, 1000, 2000, 4000 and 8000 Hz octave band center frequencies.

Model VV is specifically designed to address the 62.5, 125 and 250 Hz octave band center frequencies.

As a general statement, due to aeromechanic construction, the Model VV is the more economical selection and should be considered when the acoustical performance is satisfactory.

Silentflow® Duct Silencer Sizes

Model V is 6", 12" or 24"

Model VV is 12" and 24"

wide (W dimension)

wide (W dimension)

Also supplied in KD (Knock Down) form for maximum economy.

Standard sizes can be combined to form larger units, this is referred to as Modular Construction. The "H" dimension must be vertical when using Modular Construction to maintain structural integrity.

(See illustration on back cover)

Certified Performance

Dynamic Insertion Loss Ratings

AERACOUSTIC Silencer Model	OBCF Hz Silencer Face Velocity FUMin	DYNAMIC INSERTION LOSS IN DECIBELS							
		62.5	125	250	500	1000	2000	4000	8000
V-3	-2000	7	9	17	26	33	30	19	14
	-1000	7	9	16	25	33	30	20	14
	0	6	8	15	25	32	31	20	14
	+1000	6	8	15	24	32	31	21	15
	+2000	5	8	14	23	32	32	21	15
V-5	-2000	8	11	25	41	51	47	28	16
	-1000	8	11	24	40	50	48	29	17
	0	7	10	23	39	49	49	30	17
	+1000	6	10	22	38	48	49	31	18
	+2000	6	10	20	37	47	50	32	18
V-7	-2000	9	13	33	48	52	54	37	19
	-1000	8	13	32	48	51	54	39	20
	0	8	12	30	47	50	55	40	21
	+1000	7	11	28	47	49	55	41	21
	+2000	7	11	27	46	48	56	42	22
V-10	-2000	10	16	44	50	52	55	47	25
	-1000	10	15	43	50	52	55	48	26
	0	9	14	41	50	51	56	49	27
	+1000	8	14	39	49	51	56	50	28
	+2000	8	13	37	49	51	56	50	29
VV-3	-2000	7	11	17	19	17	15	12	10
	-1000	7	11	16	19	17	16	12	10
	0	6	10	16	19	18	16	12	10
	+1000	5	10	16	19	18	16	12	10
	+2000	5	9	15	19	18	16	13	10
VV-5	-2000	10	16	26	30	26	21	15	12
	-1000	10	16	26	30	27	22	15	12
	0	9	15	25	30	27	22	15	12
	+1000	9	14	25	30	27	23	16	12
	+2000	8	14	24	29	28	23	16	12
VV-7	-2000	12	21	36	41	36	28	18	13
	-1000	11	20	35	41	36	28	18	13
	0	11	19	35	41	37	29	19	14
	+1000	10	19	34	40	37	29	19	14
	+2000	10	18	33	40	37	30	20	14
VV-10	-2000	15	29	44	50	50	37	22	16
	-1000	14	28	44	50	51	38	23	16
	0	13	27	43	50	51	38	24	17
	+1000	12	25	43	50	52	39	25	17
	+2000	12	24	42	50	52	40	25	17

Certified Performance

Air Flow - CFM

Silencer Cross- Section W x H Inches	Silencer Face Area Sq. Ft.	Length										
		Static Pressure Drop - Inches Water										
3 Ft	.05	.10	.15	.20	.25	.30	.40	.50	.60	.80	1.00	
5 Ft	.05	.11	.17	.22	.28	.33	.44	.55	.66	.88	1.10	
7 Ft	.06	.12	.18	.24	.30	.36	.48	.60	.72	.96	1.18	
10 Ft	.07	.14	.20	.27	.34	.41	.54	.68	.82	1.09	1.36	
CFM @ 60°F, 14.7 PSIA												
6" x 12"	0.5	276	391	479	553	618	677	782	875	958	1,106	1,237
12" x 12"	1.0	553	782	958	1,106	1,237	1,355	1,565	1,750	1,917	2,213	2,475
12" x 18"	1.5	830	1,173	1,437	1,660	1,856	2,033	2,347	2,625	2,875	3,320	3,712
12" x 24"	2.0	1,106	1,565	1,917	2,213	2,475	2,711	3,130	3,500	3,834	4,427	4,950
12" x 30"	2.5	1,383	1,956	2,396	2,767	3,093	3,389	3,913	4,375	4,792	5,534	6,187
12" x 36"	3.0	1,660	2,347	2,875	3,320	3,712	4,066	4,695	5,250	5,751	6,641	7,425
12" x 42"	3.5	1,936	2,739	3,354	3,873	4,331	4,744	5,478	6,125	6,709	7,747	8,662
12" x 48"	4.0	2,213	3,130	3,834	4,427	4,950	5,422	6,261	7,000	7,668	8,854	9,900
24" x 18"	3.0	1,660	2,347	2,875	3,320	3,712	4,066	4,695	5,250	5,751	6,641	7,425
24" x 24"	4.0	2,213	3,130	3,834	4,427	4,950	5,422	6,261	7,000	7,668	8,854	9,900
24" x 30"	5.0	2,767	3,913	4,792	5,534	6,187	6,778	7,826	8,750	9,585	11,068	12,375
24" x 36"	6.0	3,320	4,695	5,751	6,641	7,425	8,133	9,391	10,500	11,502	13,282	14,850
24" x 42"	7.0	3,873	5,478	6,709	7,747	8,662	9,489	10,957	12,250	13,419	15,495	17,325
24" x 48"	8.0	4,427	6,261	7,668	8,854	9,900	10,844	12,522	14,000	15,337	17,709	19,800

AEROACOUSTIC Silencer Model V & VV

Weights and Dimensions of V and VV Duct Silencer Modules

Nominal Length	Width, in Height, in	6	12	12	12	12	12	12	24	24	24	24	24	24	
3 Ft	Wt, Lbs	30	42	56	69	75	87	99	111	99	110	130	151	171	192
5 Ft	Wt, Lbs	51	67	89	111	119	139	158	178	157	174	207	240	273	305
7 Ft	Wt, Lbs	62	92	122	137	164	191	218	245	193	225	268	310	353	396
10 Ft	Wt, Lbs	87	130	155	194	232	271	309	347	273	318	379	439	500	560

Self-Generated Noise Data in dB re 10⁻¹² Watts for 1 sq. ft. of Silencer Face Area

AEROACOUSTIC Silencer Model	Octave Band								
	Center Frequency Hz	62.5	125	250	500	1000	2000	4000	8000
	Silencer Face Velocity F/Min	Self-Generated Noise Level - dB/m ² re 10 ⁻¹² Watts							
V-3, V-5, V-7, V-10, VV-3, VV-5, VV-7, VV-10	-2000	62	55	51	53	56	60	63	60
	-1500	57	50	46	48	51	55	56	50
	-1000	50	43	39	41	44	48	45	36
	-500	38	31	27	29	32	36	29	15
	+500	24	22	16	14	13	13	12	4
	+1000	42	40	34	32	31	31	32	24
	+1500	53	51	45	43	42	42	44	38
	+2000	60	58	52	50	49	49	52	48

Self-Generated Noise

We have presented self-generated noise data in the form of db (re 10⁻¹² watts) per square foot of duct cross section. In order to find the self-generated noise for any duct cross section area, use may be made of the relation — Total PWL = PWL (per ft²) + 10 log₁₀ A, where A is the duct cross sectional area in ft².

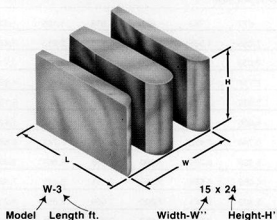
Also, the PWL per ft² of duct area figure is just 10db lower than the sound pressure level (SPL) due to self-generated noise. Merely add 10 db to the PWL per ft² figure and you have the self-generated noise sound pressure level (SPL) downstream of the silencer. This gives you an immediate clue as to whether this is an important factor in your system.



RECTANGULAR DUCT SILENCERS ULTRA LOW FRICTION — AEROFOIL DESIGN

PERFORMANCE CERTIFIED IN ACCORDANCE WITH ASTM—E477 TEST STANDARD

(Duct silencer is shown without shell so as to illustrate the internal configuration.)



Models W & WW

Model W is specifically designed to address the 500, 1000, 2000, 4000 and 8000 Hz octave band center frequencies.

Model WW is specifically designed to address the 62.5, 125 and 250 Hz octave band center frequencies.

As a general statement, due to aeromechanical construction, the Model WW is the more economical selection and should be considered when the acoustical performance is satisfactory.

Silentflow® Duct Silencer Sizes

Model W is 7½", 15" or 30" wide (W dimension)

Model WW is 15" and 30" wide (W dimension)

Also supplied in KD (Knocked Down) form for maximum economy.

Standard sizes can be combined to form larger units, this is referred to as Modular Construction. The "H" dimension must be vertical when using Modular Construction to maintain structural integrity. (See illustration on back cover)

Certified Performance

Dynamic Insertion Loss Ratings

AEROACOUSTIC Silencer Model	OBCF Hz Silencer Face Velocity F/Min	DYNAMIC INSERTION LOSS IN DECIBELS							
		62.5	125	250	500	1000	2000	4000	8000
W-3	-3000	6	8	15	23	25	22	14	10
	-1500	5	8	14	23	25	22	15	10
	0	5	7	13	22	25	23	15	11
	+1500	4	6	13	22	24	24	16	11
	+3000	3	6	12	21	24	24	16	12
W-5	-3000	8	12	23	35	40	32	21	13
	-1500	8	11	22	34	40	33	22	14
	0	7	10	21	33	39	35	22	14
	+1500	6	10	20	32	39	35	23	15
	+3000	4	9	19	31	39	36	24	16
W-7	-3000	11	15	29	47	52	42	27	17
	-1500	10	14	29	46	51	43	28	17
	0	10	14	28	45	50	45	29	18
	+1500	10	13	26	44	50	46	31	19
	+3000	9	12	25	42	49	47	32	20
W-10	-3000	12	21	41	48	52	53	36	21
	-1500	11	20	39	48	52	53	36	22
	0	11	18	38	47	51	54	40	23
	+1500	10	17	36	46	51	55	42	24
	+3000	9	15	34	45	50	56	43	25
WW-3	-3000	7	12	16	18	16	13	11	10
	-1500	7	12	15	18	16	14	11	10
	0	6	11	15	18	17	14	12	10
	+1500	6	11	14	18	17	15	12	10
	+3000	5	10	14	18	17	15	12	10
WW-5	-3000	9	15	24	26	24	17	13	11
	-1500	9	14	23	26	24	18	13	11
	0	8	14	23	26	24	18	13	11
	+1500	8	13	22	26	25	19	14	11
	+3000	7	12	21	26	25	19	14	11
WW-7	-3000	11	21	32	35	31	21	14	13
	-1500	11	21	31	35	32	22	15	13
	0	11	20	31	35	32	23	15	13
	+1500	10	19	30	35	33	23	16	14
	+3000	10	18	29	35	33	24	16	14
WW-10	-3000	13	27	44	48	42	26	17	16
	-1500	13	25	43	48	43	27	17	16
	0	12	24	42	48	44	28	18	17
	+1500	12	23	41	48	44	30	18	17
	+3000	11	22	40	48	45	31	19	17

Certified Performance

Air Flow - CFM

		Length											
		Static Pressure Drop - Inches Water											
Silencer	Silencer	3 Ft	.05	.10	.15	.20	.25	.30	.40	.50	.60	.80	1.00
Cross-	Face	5 Ft	.06	.11	.17	.22	.28	.33	.44	.55	.66	.88	1.09
Section	Area	7 Ft	.06	.12	.19	.25	.31	.37	.49	.61	.74	.98	1.23
W x H	Sq. Ft.	10 Ft	.07	.14	.21	.28	.35	.41	.55	.67	.83	1.10	1.38
Inches													

CFM @ 60°F, 14.7 PSIA

7.5" x 12"	0.63	472	668	818	944	1,056	1,157	1,336	1,494	1,636	1,889	2,113
15" x 12"	1.25	937	1,325	1,623	1,874	2,096	2,296	2,651	2,964	3,247	3,749	4,192
15" x 18"	1.88	1,409	1,993	2,442	2,819	3,152	3,453	3,987	4,458	4,884	5,639	6,305
15" x 24"	2.50	1,874	2,651	3,247	3,749	4,192	4,592	5,303	5,929	6,494	7,499	8,385
15" x 30"	3.25	2,437	3,447	4,221	4,874	5,450	5,970	6,894	7,707	8,443	9,749	10,900
15" x 36"	3.75	2,812	3,977	4,871	5,624	6,288	6,888	7,954	8,893	9,742	11,249	12,577
15" x 42"	4.38	3,284	4,645	5,689	6,569	7,345	8,046	9,291	10,387	11,379	13,139	14,690
15" x 48"	5.00	3,749	5,303	6,494	7,499	8,385	9,185	10,606	11,858	12,989	14,999	16,770
30" x 12"	2.50	1,874	2,651	3,247	3,749	4,192	4,592	5,303	5,929	6,494	7,499	8,385
30" x 18"	3.75	2,812	3,977	4,871	5,624	6,288	6,888	7,954	8,893	9,742	11,249	12,577
30" x 24"	5.00	3,749	5,303	6,494	7,499	8,385	9,185	10,606	11,858	12,989	14,999	16,770
30" x 30"	6.25	4,687	6,628	8,118	9,374	10,481	11,481	13,257	14,822	16,237	18,749	20,962
30" x 36"	7.50	5,624	7,954	9,742	11,249	12,577	13,777	15,909	17,787	19,484	22,499	25,155
30" x 42"	8.75	6,562	9,280	11,366	13,124	14,673	16,074	18,560	20,751	22,732	26,249	29,347
30" x 48"	10.00	7,499	10,606	12,989	14,999	16,770	18,370	21,212	23,716	25,979	29,999	33,540

AEROACOUSTIC Silencer Model W & WW

Weights and Dimensions of W and WW Duct Silencer Modules

Nominal Length	Width, In Height, In	Length														
		7.5	15	15	15	15	15	15	15	30	30	30	30	30	30	
3 Ft	Wt, Lbs	33	49	61	72	84	95	107	119	90	110	130	148	167	187	207
5 Ft	Wt, Lbs	52	77	95	114	133	151	170	190	141	172	203	234	275	296	327
7 Ft	Wt, Lbs	71	105	131	156	182	207	234	262	193	235	277	320	362	405	447
10 Ft	Wt, Lbs	100	131	171	211	251	291	331	371	237	304	330	414	478	541	604

Self-Generated Noise Data in dB re 10⁻¹² Watts for 1 sq. ft. of Silencer Face Area

AEROACOUSTIC Silencer Model	Octave Band Center Frequency Hz								
	Silencer Face Velocity Ft/Min								
	62.5	125	250	500	1000	2000	4000	8000	
	Self-Generated Noise Level - dB/r ² re 10 ⁻¹² Watts								
	-3000	71	60	58	61	61	68	70	67
	-2000	64	53	51	54	54	58	55	48
W-3, W-5,	-1500	59	48	46	49	49	50	45	36
W-7, W-10,	-1000	52	41	39	42	42	40	32	20
WW-3, WW-5,	+1000	42	37	30	27	26	29	26	17
WW-7, WW-10	+1500	53	48	41	38	37	40	39	31
	+2000	60	55	48	45	44	47	47	41
	+3000	71	66	59	56	55	58	60	55

Self-Generated Noise

We have presented self-generated noise data in the form of db (re 10⁻¹² watts) per square foot of duct cross section. In order to find the self-generated noise for any duct cross section area, use may be made of the relation — Total PWL = PWL (per ft²) + 10 log₁₀ A, where A is the duct cross sectional area in ft².

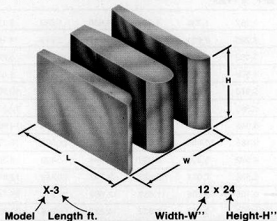
Also, the PWL per ft² of duct area figure is just 10db lower than the sound pressure level (SPL) due to self-generated noise. Merely add 10 db to the PWL per ft² figure and you have the self-generated noise sound pressure level (SPL) downstream of the silencer. This gives you an immediate clue as to whether this is an important factor in your system.

THE AEROACOUSTIC CORP.

1-800-VIA-AERO
(842-2378)

**RECTANGULAR DUCT SILENCERS
ULTRA LOW FRICTION — AEROFOIL DESIGN****PERFORMANCE CERTIFIED IN ACCORDANCE WITH ASTM—E477 TEST STANDARD**

(Duct silencer is shown without shell so as to illustrate the internal configuration.)

**Model X**

Model X is specifically designed to address the 500, 1000, 2000, 4000 and 8000 Hz octave band center frequencies.

Silentflow® Duct Silencer SizesModel X is 9", 18" or 36"
wide (W dimension)

Also supplied in KD (Knocked Down) form for maximum economy.

Standard sizes can be combined to form larger units, this is referred to as Modular Construction. The "H" dimension must be vertical when using Modular Construction to maintain structural integrity. (See illustration on back cover)

Certified Performance**Dynamic Insertion Loss Ratings**

AEROACOUSTIC Silencer Model	OBCF Hz Silencer Face Velocity Ft/Min	DYNAMIC INSERTION LOSS IN DECIBELS							
		62.5	125	250	500	1000	2000	4000	8000
X-3	-4000	4	7	11	16	19	13	10	9
	-2000	3	7	10	16	19	13	10	10
	0	3	6	10	16	20	14	10	10
	+2000	3	5	9	15	20	14	11	10
X-5	+4000	3	4	9	15	20	15	11	10
	-4000	5	9	17	26	30	19	14	11
	-2000	4	8	16	25	30	20	14	11
	0	4	8	15	24	31	21	14	11
X-7	+2000	4	7	14	24	31	22	15	12
	+4000	3	7	14	23	31	23	15	12
	-4000	6	13	22	35	41	26	18	13
	-2000	5	12	21	34	41	27	18	13
X-10	0	5	11	20	33	42	29	19	13
	+2000	4	10	19	32	42	30	19	14
	+4000	4	10	18	31	42	31	20	14
	-4000	10	16	31	50	50	36	23	15
X-10	-2000	9	15	30	48	50	38	24	15
	0	8	14	28	47	51	40	25	16
	+2000	8	13	27	45	51	41	26	16
	+4000	7	12	25	44	52	43	26	17

Certified Performance
Air Flow - CFM

Silencer Section	Silencer Face Area Sq. Ft.	Length										
		Static Pressure Drop - Inches Water										
3 Ft	.05	.10	.15	.20	.25	.30	.40	.50	.60	.80	1.00	
5 Ft	.06	.11	.16	.22	.27	.33	.44	.55	.66	.88	1.06	
7 Ft	.06	.12	.18	.24	.29	.36	.48	.60	.72	.96	1.15	
10 Ft	.07	.13	.20	.26	.32	.39	.52	.65	.78	1.04	1.27	
CFM @ 60°F, 14.7 PSIA												
9" x 12"	0.75	771	1,090	1,336	1,542	1,725	1,889	2,181	2,439	2,672	3,085	3,450
18" x 12"	1.50	1,542	2,181	2,672	3,085	3,450	3,779	4,363	4,879	5,344	6,171	6,900
18" x 18"	2.25	2,314	3,272	4,008	4,628	5,175	5,668	6,545	7,318	8,017	9,257	10,350
18" x 24"	3.00	3,085	4,363	5,344	6,171	6,900	7,558	8,727	9,758	10,689	12,343	13,800
18" x 30"	3.75	3,857	5,454	6,680	7,714	8,625	9,448	10,909	12,197	13,361	15,428	17,250
18" x 36"	4.50	4,628	6,545	8,017	9,257	10,350	11,337	13,091	14,637	16,034	18,514	20,700
18" x 42"	5.25	5,400	7,636	9,353	10,800	12,075	13,227	15,273	17,076	18,706	21,600	24,150
18" x 48"	6.00	6,171	8,727	10,689	12,343	13,800	15,117	17,455	19,516	21,378	24,686	27,600
36" x 12"	3.00	3,085	4,363	5,344	6,171	6,900	7,558	8,727	9,758	10,689	12,343	13,800
36" x 24"	6.00	6,171	8,727	10,689	12,343	13,800	15,117	17,455	19,516	21,378	24,686	27,600
36" x 30"	7.50	7,714	10,909	13,361	15,428	17,250	18,896	21,819	24,395	26,723	30,857	34,500
36" x 36"	9.00	9,257	13,091	16,034	18,514	20,700	22,675	26,183	29,274	32,068	37,029	41,400
36" x 42"	10.50	10,800	15,273	18,706	21,600	24,150	26,455	30,547	34,153	37,413	43,200	48,300
36" x 48"	12.00	12,343	17,455	21,378	24,686	27,600	30,234	34,911	39,032	42,757	49,372	55,200

AEROACOUSTIC Silencer Model X

Weights and Dimensions of X and XX Duct Silencer Modules

Noninal Length	Width, In Height, In	9	18	18	24	18	18	18	18	36	36	36	36	36	36
3 Ft	Wt. Lbs	31	53	65	77	88	100	111	124	100	138	158	177	196	216
5 Ft	Wt. Lbs	49	84	103	121	140	159	177	197	156	218	249	280	311	342
7 Ft	Wt. Lbs	67	115	140	166	192	217	243	271	212	297	340	382	425	467
10 Ft	Wt. Lbs	95	148	184	224	264	304	344	384	249	375	439	502	566	629

Self-Generated Noise Data in dB re 10⁻¹² Watts for 1 sq. ft. of Silencer Face Area

AEROACOUSTIC Silencer Model	Octave Band Center Frequency Hz								
	Silencer Face Velocity								
	FUMin	62.5	125	250	500	1000	2000	4000	8000
	-4000	74	63	61	64	64	74	79	79
	-3000	69	58	56	59	59	66	68	65
	-2000	62	51	49	52	52	56	53	47
	-1000	50	39	37	40	40	38	30	18
X-3, X-5, X-7, X-10,	+1000	38	33	26	23	22	25	23	13
	+2000	56	51	44	41	40	43	43	37
	+3000	67	62	55	52	51	54	56	51
	+4000	74	69	62	59	58	61	65	61

Self-Generated Noise

We have presented self-generated noise data in the form of db (re 10⁻¹² watts) per square foot of duct cross section. In order to find the self-generated noise for any duct cross section area, use may be made of the relation — Total PWL = PWL (per ft²) + 10 log₁₀ A, where A is the duct cross sectional area in ft².

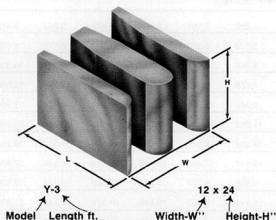
Also, the PWL per ft² of duct area figure is just 10db lower than the sound pressure level (SPL) due to self-generated noise. Merely add 10 db to the PWL per ft² figure and you have the self-generated noise sound pressure level (SPL) downstream of the silencer. This gives you an immediate clue as to whether this is an important factor in your system.



RECTANGULAR DUCT SILENCERS ULTRA LOW FRICTION — AEROFOIL DESIGN

PERFORMANCE CERTIFIED IN ACCORDANCE WITH ASTM—E477 TEST STANDARD

(Duct silencer is shown without shell so as to illustrate the internal configuration.)



Models Y & YY

Model Y is specifically designed to address the 500, 1000, 2000, 4000 and 8000 Hz octave band center frequencies.

Model YY is specifically designed to address the 62.5, 125 and 250 Hz octave band center frequencies.

As a general statement, due to aeromechanical construction, the Model YY is the more economical selection and should be considered when the acoustical performance is satisfactory.

Silentflow® Duct Silencer Sizes

Model Y is 6", 12" or 24"
wide (W dimension)

Model YY is 12" and 24"
wide (W dimension)

Also supplied in KD (Knocked Down) form for maximum economy.

Standard sizes can be combined to form larger units, this is referred to as Modular Construction. The "H" dimension must be vertical when using Modular Construction to maintain structural integrity. (See illustration on back cover)

Certified Performance

Dynamic Insertion Loss Ratings

AERODACUSTIC Silencer Model	OBCF Hz Silencer Face Velocity F/Min	DYNAMIC INSERTION LOSS IN DECIBELS							
		62.5	125	250	500	1000	2000	4000	8000
Y-3	-2000	7	12	20	30	35	36	25	16
	-1000	7	11	19	29	35	37	27	17
	0	7	10	18	27	34	37	29	18
	+1000	7	10	17	25	34	37	30	19
	+2000	6	10	17	23	33	37	32	20
Y-5	-2000	11	16	29	47	52	56	39	22
	-1000	10	15	28	46	52	56	41	24
	0	9	14	27	44	52	56	43	25
	+1000	8	13	26	43	51	55	44	26
	+2000	8	13	25	42	50	54	45	28
Y-7	-2000	12	21	42	50	52	56	47	29
	-1000	12	19	41	49	52	56	48	31
	0	11	18	40	47	52	56	49	32
	+1000	10	17	38	46	51	55	49	34
	+2000	9	16	36	45	51	55	50	36
Y-10	-2000	13	26	45	50	52	56	49	36
	-1000	13	25	44	50	52	56	50	39
	0	13	23	43	50	52	56	50	42
	+1000	12	22	43	50	52	56	50	44
	+2000	12	19	42	49	52	56	50	45
YY-3	-2000	9	15	24	27	26	22	15	11
	-1000	9	14	23	27	26	23	17	11
	0	8	14	23	26	26	24	17	12
	+1000	8	13	22	26	26	25	18	12
	+2000	7	13	22	25	26	25	18	12
YY-5	-2000	12	24	37	39	40	32	20	12
	-1000	11	23	36	39	40	33	21	13
	0	10	22	35	38	39	35	22	13
	+1000	9	21	34	37	39	36	23	14
	+2000	9	20	33	37	38	37	24	14
YY-7	-2000	14	32	45	50	52	42	25	14
	-1000	13	31	45	50	52	43	26	14
	0	12	30	44	49	51	45	28	15
	+1000	11	28	44	48	50	47	29	16
	+2000	10	27	43	47	50	48	30	17
YY-10	-2000	20	33	45	50	51	55	32	16
	-1000	18	33	45	50	52	56	34	17
	0	16	32	44	50	52	56	36	18
	+1000	15	32	44	50	52	57	37	19
	+2000	14	31	44	50	52	57	39	20

Certified Performance

Air Flow - CFM

Silencer Cross- Section W x H Inches	Silencer Face Area Sq. Ft. Inches	Length		Static Pressure Drop - Inches Water								
		3 Ft	.05	.10	.15	.20	.25	.30	.40	.50	.60	.80
5 Ft	.05	.11	.17	.22	.28	.34	.45	.56	.68	.90	1.12	1.26
7 Ft	.06	.13	.19	.25	.32	.38	.50	.62	.76	1.00	1.26	1.46
10 Ft	.07	.15	.22	.29	.36	.44	.58	.73	.88	1.16	1.46	

CFM @ 60°F, 14.7 PSIA

6" x 12" 12" x 12" 12" x 18" 12" x 24" 12" x 30" 12" x 36" 12" x 42" 12" x 48" 24" x 18" 24" x 24" 24" x 30" 24" x 36" 24" x 42" 24" x 48"	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 3.0 4.0 5.0 5.0 6.0 7.0 8.0	AEROACOUSTIC Silencer Model Y & YY	CFM											
			193	273	335	386	432	473	547	611	670	773	865	
386	547	670	773	865	947	1,094	1,223	1,340	1,547	1,730	1,927	2,127	2,327	2,595
580	820	1,005	1,160	1,297	1,421	1,641	1,834	2,010	2,210	2,321	2,595	2,894	3,094	3,460
773	1,094	1,340	1,547	1,730	1,895	2,188	2,446	2,680	3,094	3,460	3,826	4,281	4,642	5,190
967	1,367	1,675	1,934	2,162	2,368	2,735	3,058	3,350	3,868	4,325	4,781	5,190	5,605	6,055
1,160	1,641	2,010	2,321	2,595	2,842	3,282	3,669	4,020	4,642	5,190	5,605	6,055	6,462	6,920
1,353	1,914	2,345	2,707	3,027	3,316	3,829	4,281	4,690	5,415	6,055	6,462	6,920	7,339	7,736
1,547	2,188	2,680	3,094	3,460	3,790	4,376	4,893	5,360	6,189	6,920	7,339	7,736	8,150	8,550
1,730	2,321	2,842	3,282	3,669	4,020	4,642	5,190	5,605	6,055	6,462	6,920	7,339	7,736	8,150
1,927	2,595	3,094	3,460	3,790	4,376	4,893	5,360	6,189	6,920	7,339	7,736	8,150	8,550	8,950
2,127	2,894	3,460	3,826	4,281	4,690	5,190	5,605	6,055	6,462	6,920	7,339	7,736	8,150	8,550
2,327	3,094	3,669	4,020	4,435	4,840	5,245	5,650	6,055	6,462	6,920	7,339	7,736	8,150	8,550
2,595	3,460	4,020	4,435	4,840	5,245	5,650	6,055	6,462	6,920	7,339	7,736	8,150	8,550	8,950
2,894	3,826	4,435	4,840	5,245	5,650	6,055	6,462	6,920	7,339	7,736	8,150	8,550	8,950	9,350
3,094	4,281	4,840	5,245	5,650	6,055	6,462	6,920	7,339	7,736	8,150	8,550	8,950	9,350	9,750

Weights and Dimensions of Y and YY Duct Silencer Modules

Nominal Length	Width, in Height, in	6	12	12	12	12	12	12	12	24	24	24	24	24	24	24	24
3 Ft	Wt, Lbs	33	44	56	67	79	90	102	115	100	119	138	158	177	196	215	234
5 Ft	Wt, Lbs	52	70	88	107	125	144	163	184	157	188	219	250	280	311	342	373
7 Ft	Wt, Lbs	70	96	121	146	172	197	224	252	215	257	300	342	384	426	468	510
10 Ft	Wt, Lbs	87	125	158	198	238	278	318	358	262	326	412	479	516	580	644	708

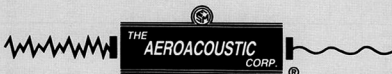
Self-Generated Noise Data in dB re 10⁻¹² Watts for 1 sq. ft. of Silencer Face Area

AEROACOUSTIC Silencer Model	Octave Band Center Frequency Hz								
	Silencer Face Velocity								
	FU/Min	62.5	125	250	500	1000	2000	4000	8000
	-2000	63	56	50	52	55	62	66	65
	-1500	58	51	45	47	50	57	61	57
Y-3, Y-5,	-1000	51	44	38	40	43	50	54	47
Y-7, Y-10,	- 500	39	32	26	28	31	38	42	30
YY-3, YY-5,	+ 500	32	29	25	21	17	16	19	11
YY-7, YY-10	+1000	50	47	43	39	35	34	37	32
	+1500	61	58	54	50	46	45	48	44
	+2000	68	65	61	57	53	52	55	52

Self-Generated Noise

We have presented self-generated noise data in the form of db (re 10⁻¹² watts) per square foot of duct cross section. In order to find the self-generated noise for any duct cross section area, use may be made of the relation — Total PWL = PWL (per ft²) + 10 log₁₀A, where A is the duct cross sectional area in ft².

Also, the PWL per ft² of duct area figure is just 10db lower than the sound pressure level (SPL) due to self-generated noise. Merely add 10 db to the PWL per ft² figure and you have the self-generated noise sound pressure level (SPL) downstream of the silencer. This gives you an immediate clue as to whether this is an important factor in your system.



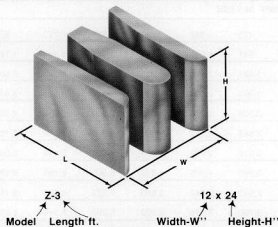
1-800-VIA-AERO

(842-2376)

RECTANGULAR DUCT SILENCERS ULTRA LOW FRICTION — AEROFOIL DESIGN

PERFORMANCE CERTIFIED IN ACCORDANCE WITH ASTM—E477 TEST STANDARD

(Duct silencer is shown without shell so as to illustrate the internal configuration.)



Models Z & ZZ

Model Z is specifically designed to address the 500, 1000, 2000, 4000 and 8000 Hz octave band center frequencies.

Model ZZ is specifically designed to address the 62.5, 125 and 250 Hz octave band center frequencies.

As a general statement, due to aeromechanic construction, the Model ZZ is the more economical selection and should be considered when the acoustical performance is satisfactory.

Silentflow® Duct Silencer Sizes

Model Z is 6", 12" or 24"

Model ZZ is 12" and 24"

wide (W dimension)

wide (W dimension)

Also supplied in KD (Knocked Down) form for maximum economy.

Standard sizes can be combined to form larger units, this is referred to as Modular Construction. The "H" dimension must be vertical when using Modular Construction to maintain structural integrity.

(See illustration on back cover)

Certified Performance

Dynamic Insertion Loss Ratings

AERACOUSTIC Silencer Model	OBCF Hz Silencer Face Velocity Ft/Min	DYNAMIC INSERTION LOSS IN DECIBELS							
		62.5	125	250	500	1000	2000	4000	8000
Z-3	-4000	6	7	10	19	26	19	12	8
	-2000	5	6	9	18	25	20	13	8
	0	4	6	9	17	24	21	14	9
	+2000	4	6	8	16	24	22	15	10
	+4000	3	5	8	16	23	22	15	11
Z-5	-4000	7	8	15	29	40	30	17	10
	-2000	7	8	14	28	40	31	17	10
	0	6	7	13	27	39	33	18	11
	+2000	6	7	12	26	39	34	19	13
	+4000	5	7	11	25	38	35	20	14
Z-7	-4000	8	10	21	39	48	41	23	14
	-2000	8	9	19	37	48	43	23	15
	0	7	8	18	35	47	45	24	15
	+2000	7	8	16	33	46	47	26	16
	+4000	6	8	15	32	45	48	27	16
Z-10	-4000	10	12	29	46	52	52	30	18
	-2000	10	11	27	45	52	53	32	19
	0	10	10	25	44	51	54	34	19
	+2000	9	10	23	44	51	55	35	20
	+4000	9	9	21	43	50	56	37	20
ZZ-3	-4000	7	7	13	17	16	13	11	10
	-2000	7	7	12	17	16	14	11	9
	0	6	7	12	16	17	14	12	9
	+2000	6	6	11	16	17	15	12	8
	+4000	5	6	11	16	17	15	12	8
ZZ-5	-4000	8	12	19	26	24	17	13	13
	-2000	8	11	18	26	24	18	13	12
	0	7	11	17	25	24	18	13	12
	+2000	7	10	17	25	25	19	14	11
	+4000	7	10	16	24	25	20	14	11
ZZ-7	-4000	10	15	26	35	31	21	14	13
	-2000	9	14	24	35	32	22	15	13
	0	9	13	23	34	32	22	15	13
	+2000	8	12	22	34	33	23	16	14
	+4000	8	12	21	33	33	24	16	14
ZZ-10	-4000	12	19	35	49	42	26	17	16
	-2000	12	18	34	48	43	27	17	16
	0	12	17	32	48	44	28	18	17
	+2000	11	15	30	47	44	30	18	17
	+4000	10	14	29	46	45	31	19	17

Certified Performance

Air Flow - CFM

Silencer Cross- Section W x H Inches	Silencer Face Area Sq. Ft.	Length										
		3 Ft	.05	.10	.15	.20	.25	.30	.40	.50	.60	.80
5 Ft	.05	.11	.17	.22	.28	.33	.44	.55	.66	.88	1.12	
7 Ft	.06	.13	.19	.26	.32	.39	.52	.65	.78	1.04	1.29	
10 Ft	.07	.15	.22	.30	.37	.45	.60	.75	.90	1.20	1.48	

CFM @ 60°F, 14.7 PSIA

Length	CFM	Static Pressure Drop - Inches Water										
		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	
6" x 12"	0.5	514	727	890	1,028	1,150	1,259	1,454	1,626	1,781	2,057	2,300
12" x 12"	1.0	1,028	1,454	1,781	2,057	2,300	2,519	2,909	3,252	3,563	4,114	4,600
12" x 18"	1.5	1,542	2,181	2,672	3,085	3,450	3,779	4,363	4,879	5,344	6,171	6,900
12" x 24"	2.0	2,057	2,909	3,563	4,114	4,600	5,039	5,818	6,505	7,126	8,228	9,200
12" x 30"	2.5	2,571	3,636	4,453	5,142	5,750	6,298	7,273	8,131	8,907	10,285	11,500
12" x 36"	3.0	3,085	4,363	5,344	6,171	6,900	7,558	8,727	9,758	10,689	12,343	13,800
12" x 42"	3.5	3,600	5,091	6,235	7,200	8,050	8,818	10,182	11,384	12,471	14,400	16,100
12" x 48"	4.0	4,114	5,818	7,126	8,228	9,200	10,076	11,637	13,010	14,252	16,457	18,400
24" x 18"	3.0	3,085	4,363	5,344	6,171	6,900	7,558	8,727	9,758	10,689	12,343	13,800
24" x 24"	4.0	4,114	5,818	7,126	8,228	9,200	10,076	11,637	13,010	14,252	16,457	18,400
24" x 30"	5.0	5,142	7,273	8,907	10,285	11,500	12,597	14,546	16,263	17,815	20,571	23,000
24" x 36"	6.0	6,171	8,727	10,689	12,343	13,800	15,117	17,455	19,516	21,378	24,686	27,600
24" x 42"	7.0	7,200	10,182	12,471	14,400	16,100	17,636	20,385	22,768	24,942	28,800	32,200
24" x 48"	8.0	8,228	11,637	14,252	16,457	18,400	20,156	23,274	26,021	28,505	32,914	36,800

AERACOUSTIC Silencer
Model Z & ZZ

Weights and Dimensions of Z and ZZ Duct Silencer Modules

Nominal Length	Width, in Height, In	6	12	12	12	12	12	12	24	24	24	24	24	24	
3 Ft	Wt, Lbs	31	41	51	61	71	81	92	104	91	107	123	139	156	172
5 Ft	Wt, Lbs	49	65	81	97	113	129	149	167	143	169	195	221	247	273
7 Ft	Wt, Lbs	67	89	111	133	155	178	205	230	196	231	267	303	339	374
10 Ft	Wt, Lbs	88	128	167	186	221	256	291	327	262	320	378	436	494	552

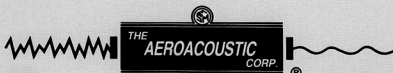
Self-Generated Noise Data in dB re 10⁻¹² Watts for 1 sq. ft. of Silencer Face Area

AERACOUSTIC Silencer Model	Octave Band									
	Center Frequency Hz	62.5	125	250	500	1000	2000	4000	8000	
	Silencer Face Velocity F/Min	Self-Generated Noise Level - dB/ft ² re 10 ⁻¹² Watts								
Z-3, Z-5, Z-7, Z-10, ZZ-3, ZZ-5, ZZ-7, ZZ-10	-4000	74	63	61	64	64	74	79	79	
	-3000	69	58	56	59	59	65	68	65	
	-2000	62	51	49	52	52	56	53	47	
	-1000	50	39	37	40	40	38	30	18	
	+1000	38	33	26	23	22	25	23	13	
	+2000	56	51	44	41	40	43	43	37	
	+3000	67	62	55	52	51	54	56	51	
	+4000	74	69	62	59	58	61	65	61	

Self-Generated Noise

We have presented self-generated noise data in the form of db (re 10⁻¹² watts) per square foot of duct cross section. In order to find the self-generated noise for any duct cross section area, use may be made of the relation — Total PWL = PWL (per ft²) + 10 log₁₀ A, where A is the duct cross sectional area in ft².

Also, the PWL per ft² of duct area figure is just 10db lower than the sound pressure level (SPL) due to self-generated noise. Merely add 10 db to the PWL per ft² figure and you have the self-generated noise sound pressure level (SPL) downstream of the silencer. This gives you an immediate clue as to whether this is an important factor in your system.



1-800-VIA-AERO

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TERMINOLOGY

ABSORPTION COEFFICIENT: The percentage of a sound energy incident on the surface of a material that is absorbed by the material.

ACOUSTICS: The science of sound including its production, transmission and effects or the qualities that determine the value of a room or other enclosed space with respect to distinct hearing.

AMBIENT NOISE: The all encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far.

ATTENUATION: The decrease in sound power as sound waves travel through a silencer.

A-WEIGHTING: A method by which the sound pressure level spectrum can be related to the human perception of noise intensity. The result is a single number evaluation of loudness.

DECIBEL (dB): A unit for expressing the ratio of two amounts of acoustic signal power equal to ten times the common logarithm of this ratio.

DIVERGENCE: The rate of decrease of sound pressure with distance from a source.

DYNAMIC INSERTION LOSS (DIL): The difference between two sound pressure levels measured at the same point in space before and after a silencer is inserted in the system and operating under the rated flow conditions.

END REFLECTION: Occurs when sound is transmitted across an abrupt change in area, such as when a duct discharges into a room, some of the sound energy is reflected back into the duct.

FLANKING TRANSMISSION: Noise that reaches an observer by paths around or over an acoustical barrier.

FREE FIELD: Area beyond the near field, with no obstructions, where the sound pressure levels decay six decibels for each doubling of the distance from the near field.

FREQUENCY: The number of times that a periodic function repeats that same sequence of values during a unit variation of the independent variable - frequency is measured in cycles per second or hertz.

LOUDNESS: The magnitude of the auditory sensation a person experiences.

MYLAR: A polyester film one mil thick (0.001") that can operate at a maximum temperature of 250° F.

NEAR FIELD: A hemispherical space where sound pressure waves from one radiating surface tend to interfere with waves generated by other surfaces. The near field boundary, the distance from the radiating surface, is related to the wavelength of the lowest frequency and overall size of source.

NOISE: unwanted sound.

OCTAVE BAND (OB): A range of frequencies where the highest frequency of the band is double the lowest frequency of the band. The band is usually specified by the center frequency.

OCTAVE BAND CENTER FREQUENCY (OBCF): The square root of the product of the lower and upper limit of the frequency band.

SELF-GENERATED NOISE: Noise generated by the turbulence of air passing through the silencer.

SOUND: Mechanical radiant energy that is transmitted by longitudinal pressure waves in a material medium (air) and is the objective cause of hearing.

SOUND INTENSITY: The average rate of sound energy transmitted through a unit area normal to the wave direction at the point considered.

SOUND POWER LEVEL (PWL): A measure of the total sound energy radiated by a source, in decibels, and is ten times the logarithm to the base ten of the ratio of the sound power radiated by the source to a reference power. The reference power is one picowatt.

SOUND PRESSURE: A fluctuating pressure superimposed on the static pressure by the presence of sound. In air, the static pressure is barometric pressure.

SOUND PRESSURE LEVEL (SPL): A measure of the air pressure change caused by a sound wave, in decibels, and is twenty times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure. The reference pressure is 0.0002 microbars.

SPEED OF SOUND (C): The rate at which a disturbance travels through a medium (at 68°F, the speed of sound through air is 1,127 Ft./Sec.).

STATIC PRESSURE (SP): The potential pressure exerted in all directions by a fluid (air) at rest. For a fluid in motion, the pressure is measured in a direction normal to the direction of the flow.

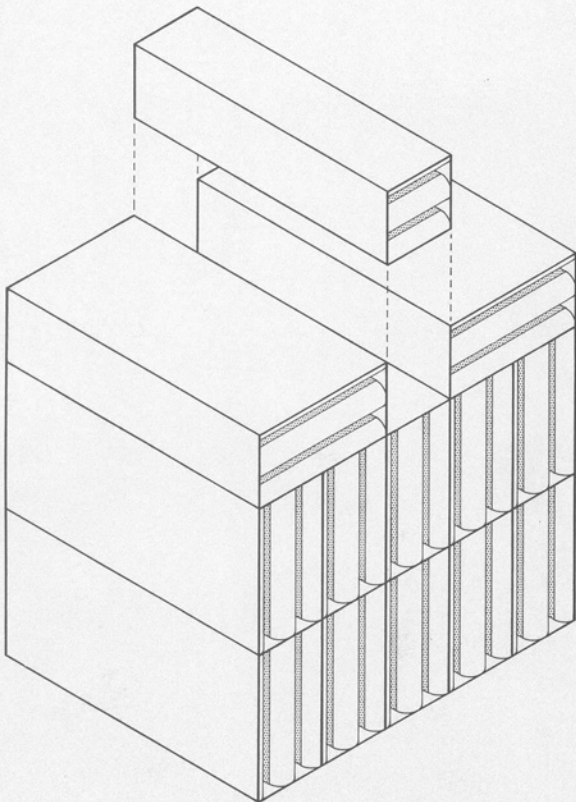
TRANSMISSION LOSS (TL): The number of decibels by which sound incident on an object is reduced in transmission through it.

VELOCITY PRESSURE (VP): The kinetic pressure in the direction of flow necessary to cause a fluid (air) at rest to flow at a given velocity.

WAVELENGTH: The distance that a sound wave travels in one period.

Modular Construction

The parallel aeromechanic placement of single silencers



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