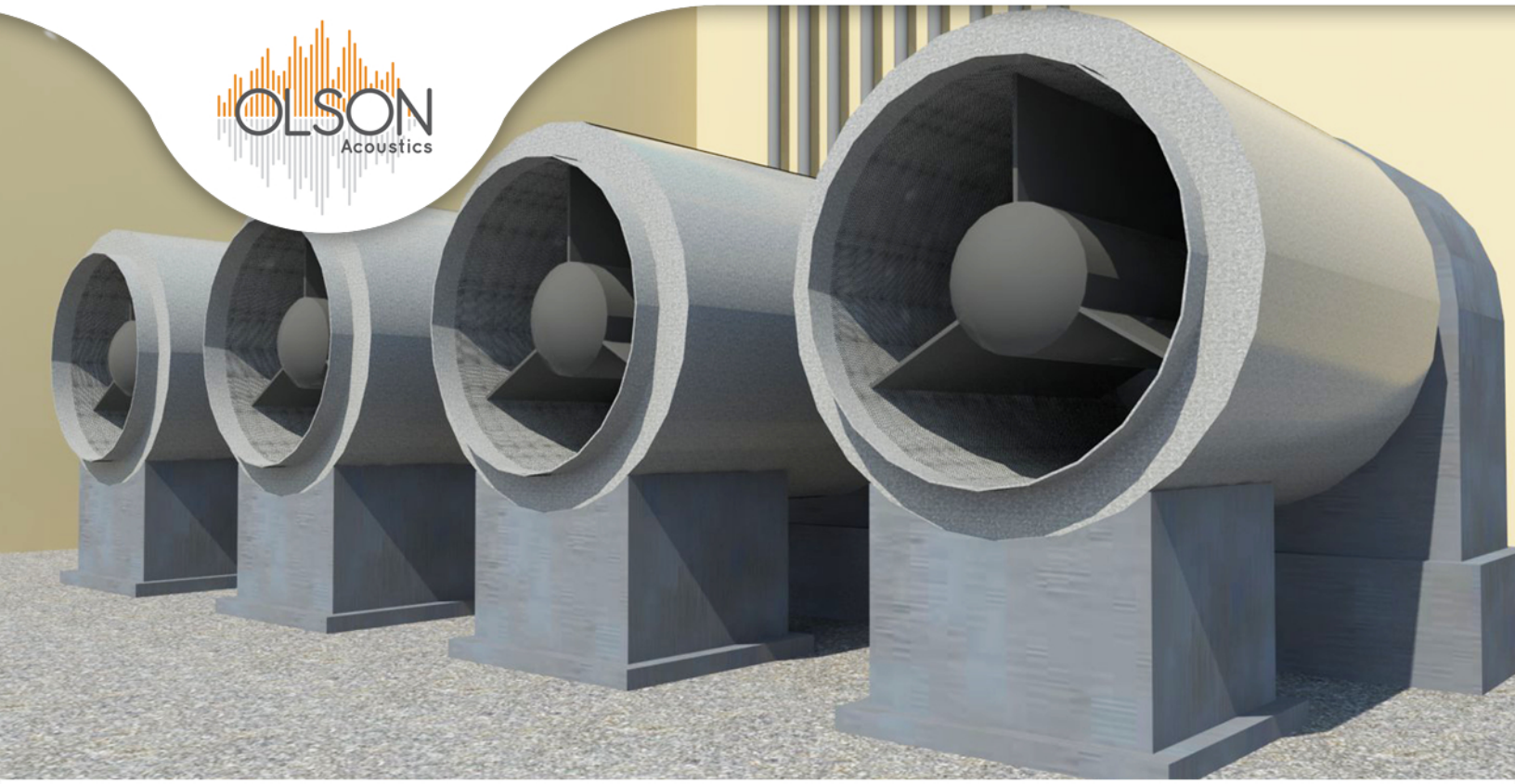


Circular Sound Attenuator

Circular Sound Attenuator reduces noise travelling from air handling unit and supply ventilation ducts. Designed with pod at the center to minimize the pressure loss and generated noise. Air passage and pod diameter varies depending on the required low and high frequency attenuation. Different lengths are provided for the amount of attenuation required.

The attenuator is constructed of specially selected high quality materials. The casing is made of high quality pre-galvanized steel sheet. Aerodynamically designed pod is constructed pre-galvanized perforated steel sheet with medium density fiberglass in-fill material for maximum sound attenuation.

Note: Circular Sound Attenuators may also be constructed of stainless steel material for marine, pharmaceutical or clean room applications. In-fills may also be made of acoustic foam for clean room purposes.

FOR NOISE CONTROL IN AIR HANDLING SYSTEMS

Flexible and Efficient Design System

Fans in large air handling systems usually produce undesirable high noise level that may be transmitted through both the supply and return air systems serving the conditioned areas of a building.

To provide the proper acoustical environment in the occupied areas, we have developed a line of sound attenuators which have been thoroughly tested by the National Association of Testing Authority (NATA) registered laboratory and the results published herein.

TESTING AND PERFORMANCE

According to the 1971 Methods of Test for Silencers for Air Distribution Systems

All static insertion loss, generated sound power levels and pressure loss data were obtained in an independent testing laboratory in accordance with BS4718 "1971 Methods of Test for Silencers for Air Distribution System." The static insertion loss was measured without airflow through the attenuator. Additionally, the dynamic insertion was measured with airflow travelling with (supply air) and against (return air) the direction of noise flow. It is recognized that the velocity of air flow through the sound attenuator slightly affect its attenuation. However, exhaustive tests indicated that the effect is negligible for the range of velocities tested. Instead, consideration should be given to generated sound as air velocity increases may limit the attenuation achieved by the sound attenuator

SPECIFICATIONS

Circular sound attenuator casings are constructed of minimum 0.7 mm galvanized steel sheet with aerodynamically designed splitters. Splitters shall be constructed of galvanized steel perforated sheet of 23% open area with medium density bonded fiberglass in-fill. Hole diameter of perforated sheet must not exceed 3.0 mm to prevent erosion. Test data on static insertion loss, generated noise and pressure loss with airflow up to 7 m/s must be submitted for approval. These datas must be obtained in a reverberant chamber in accordance with BS 4718: "1971 Methods of Tests for Silencers for Air Distribution Systems." Sound attentuators shall be pod-type models as manufactured by OLSON Acoustics (S) Pte Ltd.

APPLICATION

To obtain the rated performance from a circular sound attenuator, the air velocity should be uniform across the entire face area of the unit. A circular sound attenuator should not be located immediately after a duct elbow or divided flow fitting. Either type of fitting can cause unsymmetrical airflow as the air enters the circular sound attenuator, thereby resulting in too high air velocity on one side of the unit with a resulting increase in pressure loss and generated sound level. If an enlarger must be used immediately ahead of the circular sound attenuator, the included angle of the enlarger should not exceed 15 degrees. If a reducer is necessary rather than an enlarger, the included angle of the reducer is not as critical with 45 degrees being the maximum desirable angle.

STANDARD SIZES

Standard Diameters of Circular Sound Attenuators

300, 450, 600, 750, 900, 1050, 1200, 1300, 1400, 1500 mm

Standard Lengths of Circular Sound Attenuators

900, 1200, 1500, 1800 mm

HOW TO ORDER

When ordering circular sound attenuators, specify as follows: type, length, width and height.

XX-XXX-XXX

Model	Standard circular sound attenuator's length	Standard circular sound attenuator's diameter
MPC: High Performance LPC: Standard Performance	90 - 900 mm 120 - 1200 mm 150 - 1500 mm 180 - 1800 mm Other lengths are available upon request	30 - 300 mm 45 - 450 mm 60 - 600 mm 75 - 750 mm 90 - 900 mm 105 - 1050 mm 120 - 1200 mm 130 - 1300 mm 140 - 1400 mm 150 - 1500 mm Other widths are available upon request

SELECTION PROCESS GUIDE

Step 1

Determine the dynamic insertion loss required. This may be obtained by subtracting the required noise level after the attenuator from the sound level of the equipment.

Step 2

Determine the type and length of the sound attenuator that will give the required insertion loss from table 1.

Step 3

Adjust resultant noise for the generated noise of sound attenuator from table 3. After adjustment, if the resultant noise is equal or less than the required noise downstream of the sound attenuator, the selection is acceptable.

Step 4

From figure 1, determine the face velocity that will meet the static pressure loss allowed.

Step 5

Determine the size of the sound attenuator base on the face velocity determined in step 4.

EXAMPLE SELECTION

It is desired to reduce the noise level of a centrifugal fan to NC 70 immediately downstream of the sound attenuator. Airflow capacity of the fan is 20,000 CMH. Allowable static pressure to the sound attenuator is 50 Pa. The sound power level of the centrifugal fan is as follows:

	Octave band centre frequency, Hz	125	250	500	1000	2000	4000	8000
1	Fan Sound Power Level (SWL)	93	92	90	88	85	82	80
2	Required noise downstream of sound attenuator, NC70	79	75	72	71	70	69	68
3	Required Insertion Loss (1) - (2)	14	17	18	17	15	13	12
From table 1: Model MPC-180 of 1800mm length should meet the required attenuation.								
4	MPC-180 Dynamic Insertion Loss from table 1	14	21	35	39	35	26	18
5	MPC-180 Generated Noise from table 3	45	37	36	34	34	26	27
6	Resultant noise downstream of sound attenuator before adjusting for generated noise (1) - (4)	79	71	56	49	50	57	62
7	Resultant noise downstream of sound attenuator after adjusting for generated noise compare (5) & (6)	79	71	56	49	50	57	62
Compare (2) and (7) shows resultant noise lower than the required noise level at each octave confirming MPC-180 selection.								
8	From figure 1: Sound attenuator face velocity is 3.5m/s or 12,600m/hr based on 50 Pa pressure loss.							
9	Sound attenuator face area required = 20,000m3/hr / 12,600m/hr = 1.59m2, sound attenuator of size 1500W X 1050H or 1800W X 900H or 2100W X 750H will meet the required face area.							

In all octave bands, the generated noise is less than the required NC 70. Therefore, the selection is acceptable.

TECHNICAL DATA

All static insertion loss, generated sound power levels and static pressure loss data were obtained in a reverberation and in accordance with BS4718: "1971 Methods of Tests for Silencers for Air Distribution Systems."

Note 1: When designing duct system for sound, generated noise of sound attenuator can become an important consideration. The generated noise of a sound attenuator determines the minimum noise levels that can be realized downstream of the attenuator. Regardless of the attenuation of the sound attenuator, the noise level leaving the unit cannot be lower than its generated noise level. OLSON Acoustics sound attenuator have been designed to minimize generated noise, thereby permitting higher degrees of attenuation.

Table 1. Dynamic Insertion Loss - dB

Model	Octave Band Center Frequency (Hz)						
	125	250	500	1000	2000	4000	8000
MPC-90	6	15	26	35	28	23	14
MPC-120	10	19	31	30	32	24	16
MPC-150	12	20	33	38	34	25	17
MPC-180	14	21	35	39	35	26	18
LPC-90	4	10	21	28	22	11	11
LPC-120	6	15	26	30	25	15	14
LPC-150	7	16	27	32	27	16	15
LPC-180	8	17	29	34	28	18	15

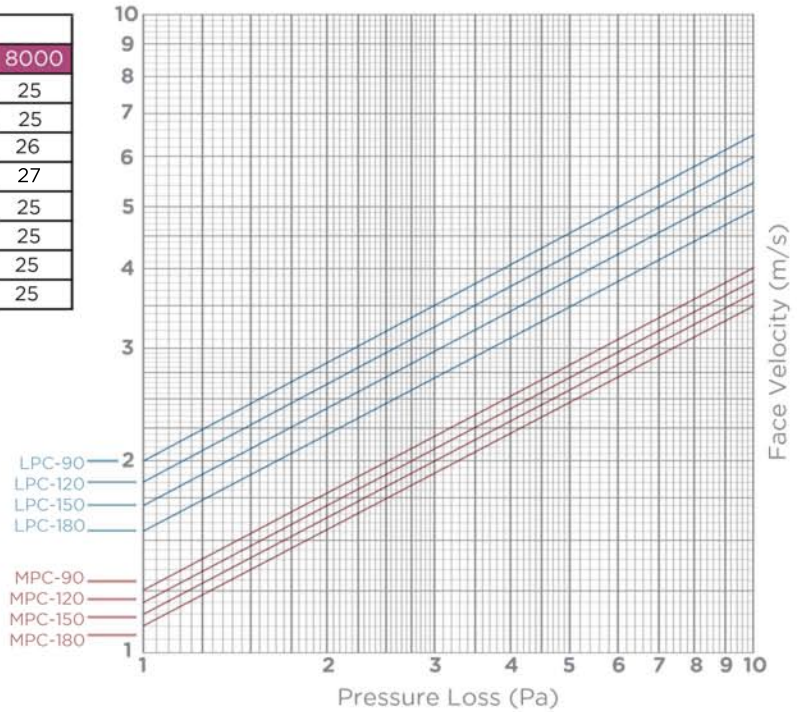
Table 2. Static Insertion Loss - dB

Model	Octave Band Center Frequency (Hz)						
	125	250	500	1000	2000	4000	8000
MPC-90	6	15	26	33	28	23	14
MPC-120	11	19	31	37	32	25	16
MPC-150	12	21	34	39	34	26	17
MPC-180	14	23	37	41	36	27	19
LPC-90	4	10	21	29	22	12	11
LPC-120	6	15	25	32	26	15	14
LPC-150	7	16	27	33	28	17	15
LPC-180	8	18	29	35	30	20	14

Table 3. Generated Sound Power Level - dB (re 10^{-12} watts at 7m/s)

Model	Octave Band Center Frequency (Hz)						
	125	250	500	1000	2000	4000	8000
MPC-90	45	36	36	35	34	24	25
MPC-120	45	36	36	36	34	24	25
MPC-150	45	37	36	35	34	25	26
MPC-180	45	37	36	34	34	26	27
LPC-90	44	36	35	35	34	25	25
LPC-120	44	36	35	35	34	25	25
LPC-150	45	35	35	35	34	25	25
LPC-180	46	35	36	35	34	25	25

Fig 1. Static pressure loss through Circular Sound Attenuator



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