ATTENUATOR SELECTION PROCEDURE

INTRODUCTION

Assessing whether an attenuator would reduce noise effectively enough for a particular situation usually requires complete equipment noise data and attenuator insertion loss (SIL) spectrums. Acoustic calculations then have to be performed to assess the resultant noise levels with the attenuator.

To give the reader a general understanding of the noise reduction performance of different attenuators, the methodology presented in this section provides attenuator performance as a single noise reduction value against a Low Frequency Biased or General HVAC noise profile.

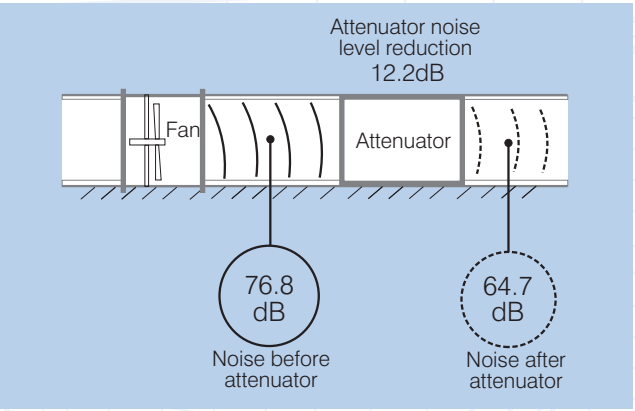
The performance of an attenuator in a specific case may vary from these general noise reductions. To assess if this general advice applies to a specific case, assistance is available through our nearest sales office and through the acoustic analysis tool in the Fans By Fantech Selection Program and Fantech Website.

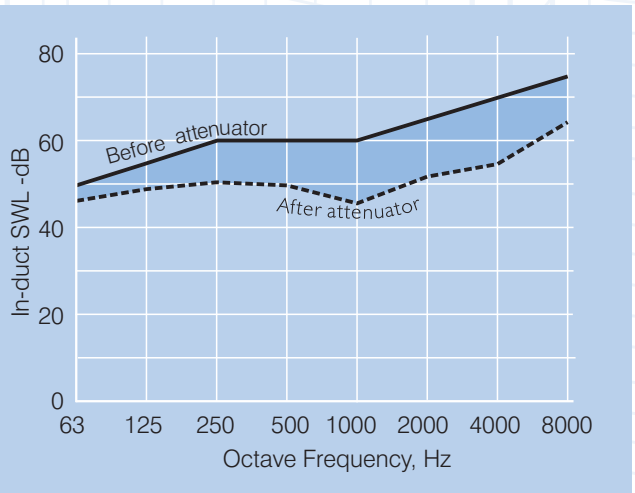
To make an attenuator selection that will provide satisfactory performance, there are several criteria that have to be addressed.

1. Acoustic attenuation/silencing performance

The reduction in noise offered by an acoustic attenuator varies according to the source of the noise being controlled. Being technically specific, it depends on whether the noise is particularly loud in low frequencies/tones. In the example below, two different noises could have the same overall decibel levels but because one is from a generator set (low frequency biased), the performance of the same acoustic attenuator varies to that of a general HVAC system.

General fan noise
(Example fan coil unit)

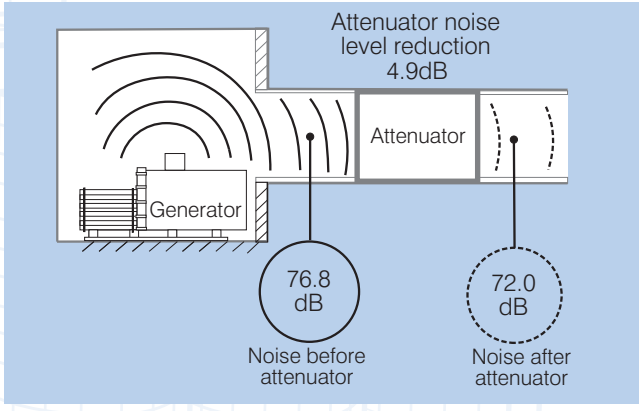


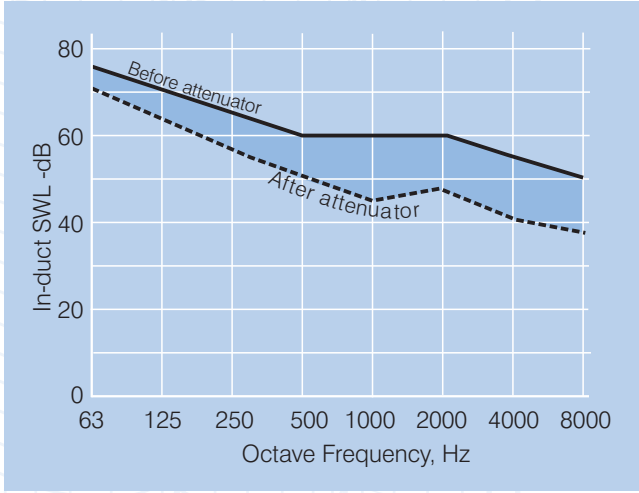


	High Freq Bias Noise dB	Overall Level	Attenuator Loss dB	After Attenuator dB	Overall Level
63Hz	50		4	46	
125Hz	55		6	49	
125Hz	60		9	51	
500Hz	60	76.8	10	50	64.7
1000Hz	60		15	45	
2000Hz	65		13	52	
4000HZ	70		14	56	
8000HZ	75		12	63	

Attenuator Noise Level Reduction 12.2dB

Low frequency biased noise
(Example generator set)





	Low Freq Bias Noise dB	Overall Level	Attenuator Loss dB	After Attenuator dB	Overall Level
63Hz	75		4	71	
125Hz	70		6	64	
125Hz	65		9	56	
500Hz	60	76.8	10	50	72.0
1000Hz	60		15	45	
2000Hz	60		13	47	
4000HZ	55		14	41	
8000HZ	50		12	38	

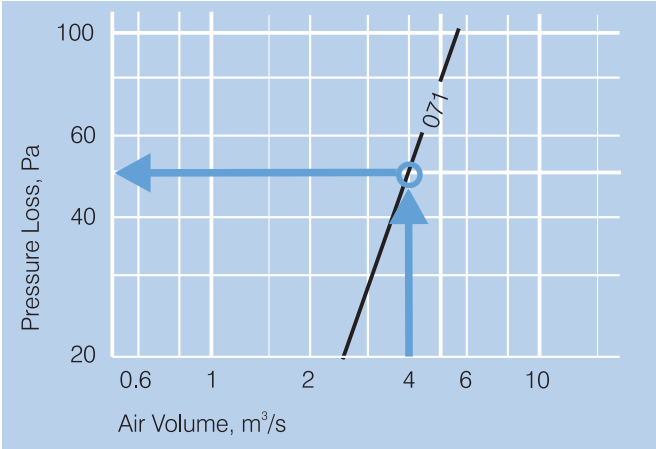
Attenuator Noise Level Reduction 4.9dB

2. Attenuator Pressure Loss

A sound attenuator restricts the passage of air flow through it. The restriction of the attenuator is defined in Pa of static pressure loss. The pressure loss of the attenuators in this catalogue is charted in two different ways:

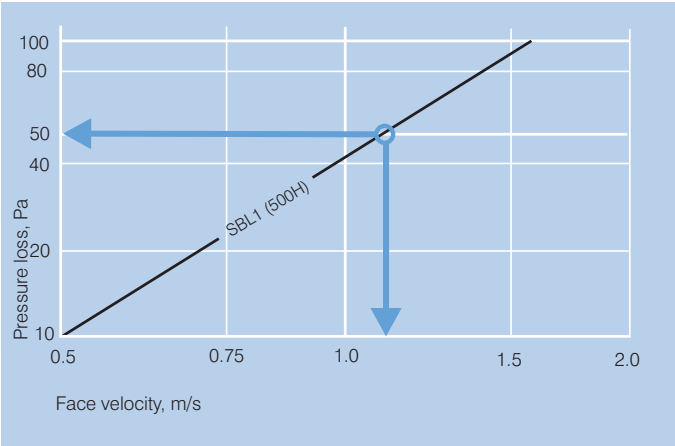
a) Pressure loss at a given air flow

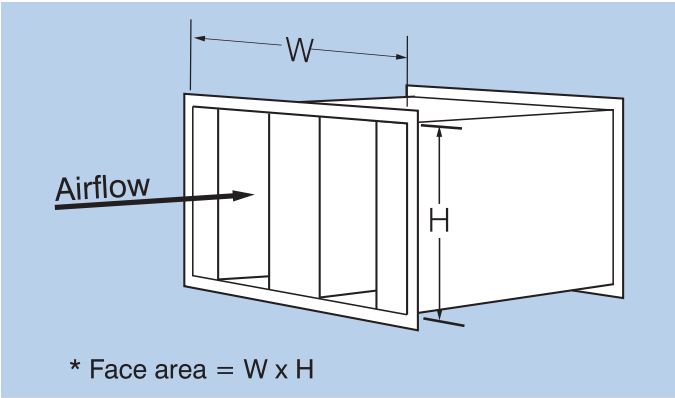
For the C, C.P, CC series circular attenuators and POW series attenuators, the static pressure loss is charted for each model at different airflows. For example, if we select an attenuator model C2P-071 with an air flow of 4m^3/s, the pressure loss is 50Pa.



b) Variable Face Area (Width or Height)

Some attenuator types are expected to be built to varying widths and heights to suit the duct or wall sizing. With acoustic louvres for example, pressure losses for a given model are graphed against face velocity:





$$\text{Face velocity} = \frac{\text{Airflow}}{\text{Face Area*}}$$

For rectangular attenuators, the velocities are provided for a given model at 20Pa or 50Pa at different lengths as per below: (See Page H-7)

Face Velocity of 50Pa Pressure Drop