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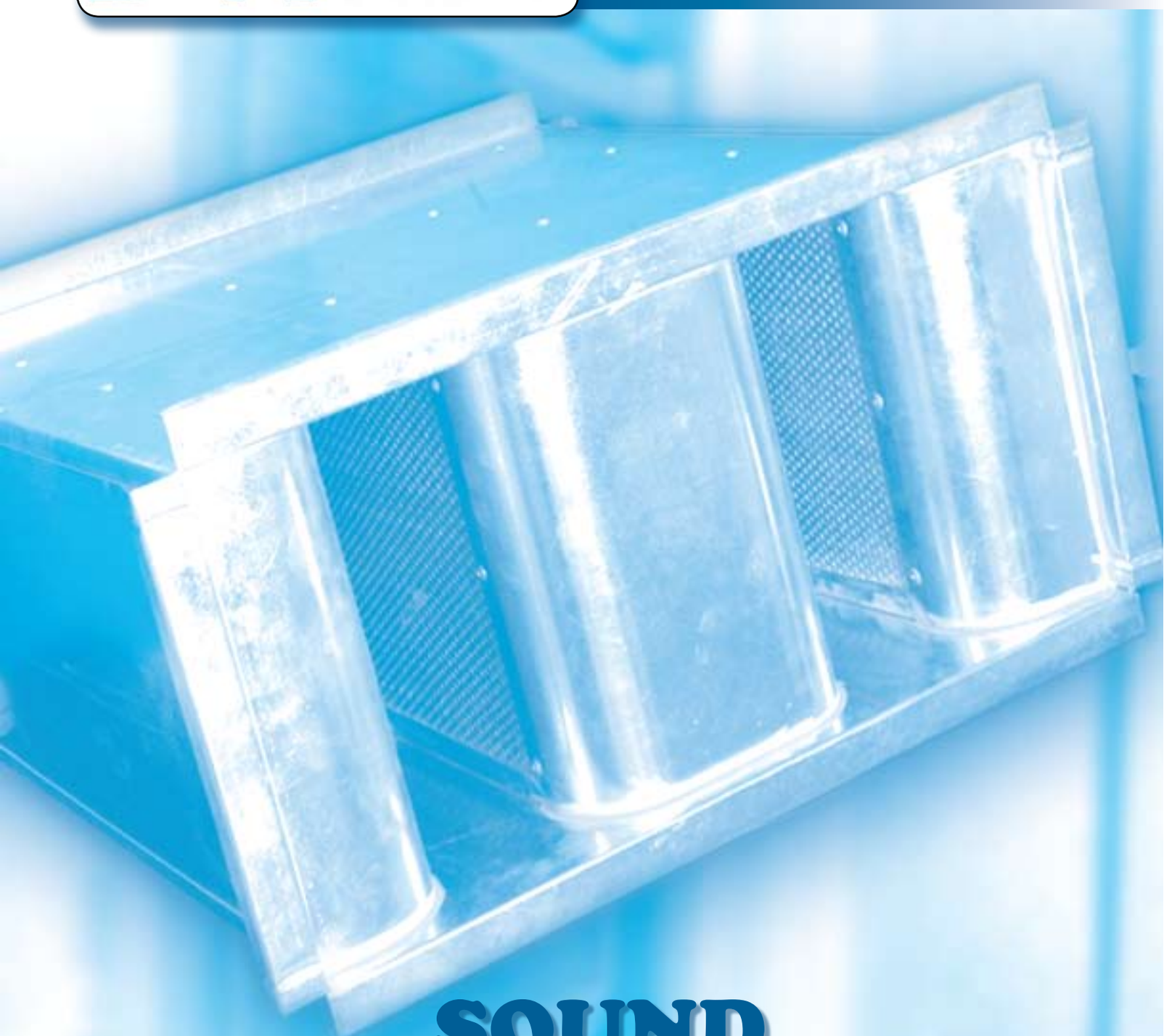
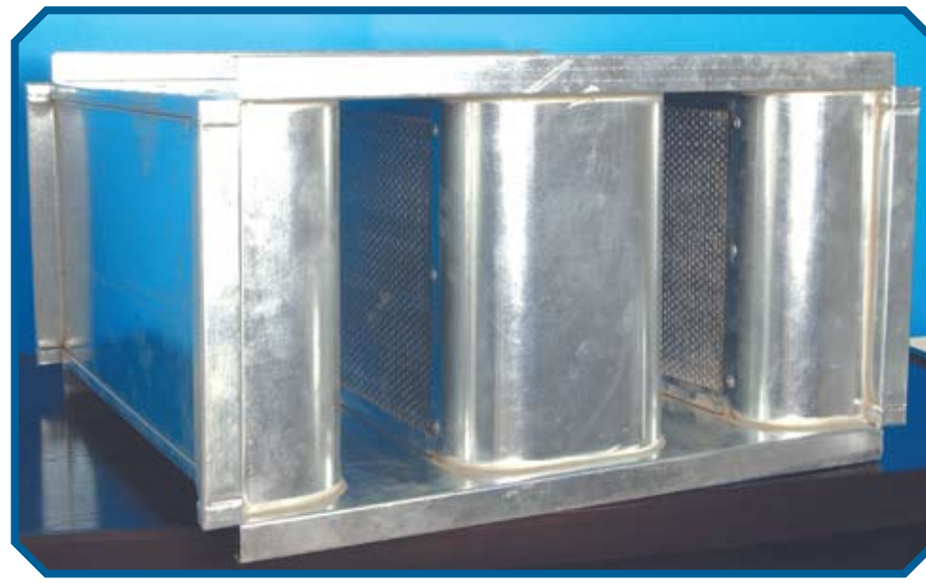


SOUND ATTENUATORS

Sound Attenuators:

Description

The DS rectangular cased attenuator design offers many advanced features including aerodynamic splitters, side liners, slide-on flanges, and erosion protected acoustic infill covered by galvanized perforated metal sheets. Casing conforms to DW 142 Class B ductwork code.

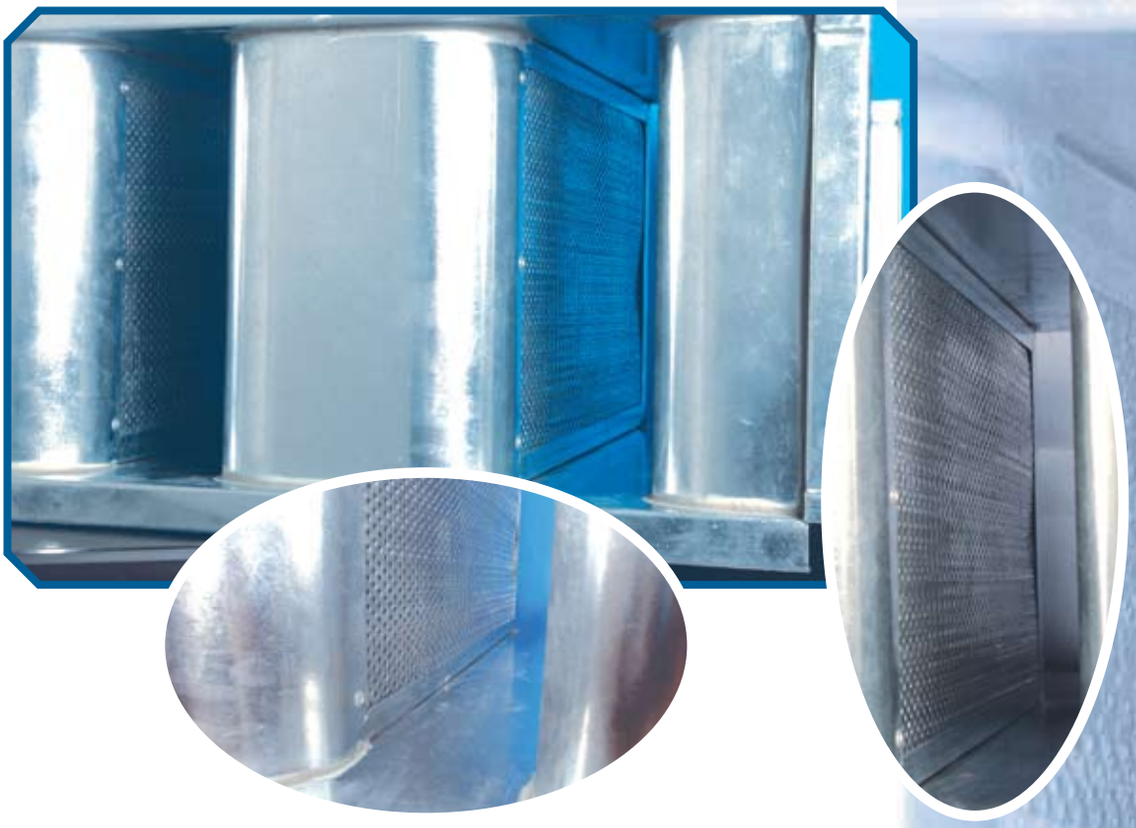


Acoustic Infill:

All "Acoustic Infill" material are inert, non-flammable, non-hygroscopic, will not sustain vermin or fungus, and odorless. The "Acoustic fill" is coated with matt-black fleece tissue for drip protection.

Technical specifications: Rock wool

Characteristic	Symbol	Description/Data			Unit	Test Classification
Fire behavior	– –	A 1 "non-combustible"			(---)	ON-EN 13501-1
Application temperature limit	– –	200°C- stone-wool 150°C - coating			(°C)	
Melting point of stone wool fibers	– –	Over 1000°C			(°C)	DIN 4102-4
Declared value of thermal conductivity	λ	0,037			(°C)	ÖN-EN 13162
Thermal resistance	T	30	50	60	(mm)	ÖN-EN 13162
	R_0	0,80	1,35	1,60	(m^2K/W)	
Water vapor diffusion resistance figure	μ	1				ON-EN13162
Specific heat capacity	C_p	0,84			(k/kg.K)	



Dimensions – Construction:

Construction

Type DS attenuator casings and splitters are manufactured using galvanized steel sheets 1 mm thick minimum.
Casings are formed with either stand-up or lock formed seams with a mastic sealant; the construction complies with DW 144 Class B code. 30x30x3 mm flanges are fitted as standard.
The splitters contain acoustic infill with glass tissue facing and is contained behind perforated metal sheets; this dual protection prevents damage and fiber erosion up to 30m/s airway velocity.
The splitters are radiussed at both ends to minimize air pressure loss and regenerated noise.
A combination of acoustic splitter and airway produces an attenuator module. The first 'module' comprises two half width side liners plus an airway.

Selection:

Selection is prepared using a computer aided program. The program will give the following results:

- Attenuator insertion loss dB.
- Calculated insertion loss.
- Pressure drop across attenuator Pa.
- Recommended Attenuator size W x H x L (mm)

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Bend Attenuators:

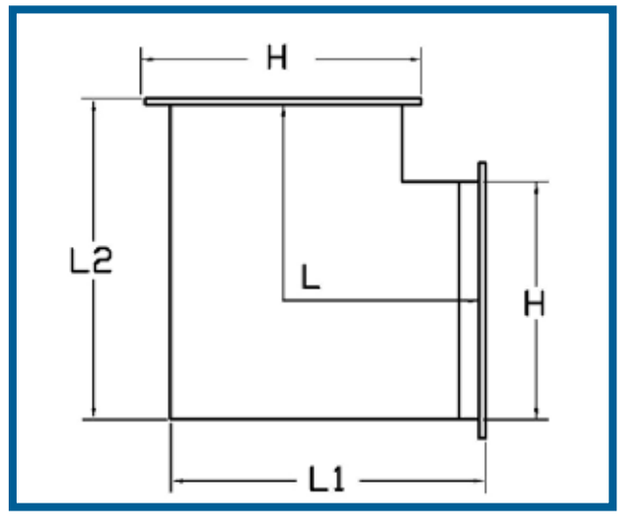
The construction of cased bend attenuators is generally similar to the straight version. To minimize resistance to airflow, turning vanes are incorporated into the design.

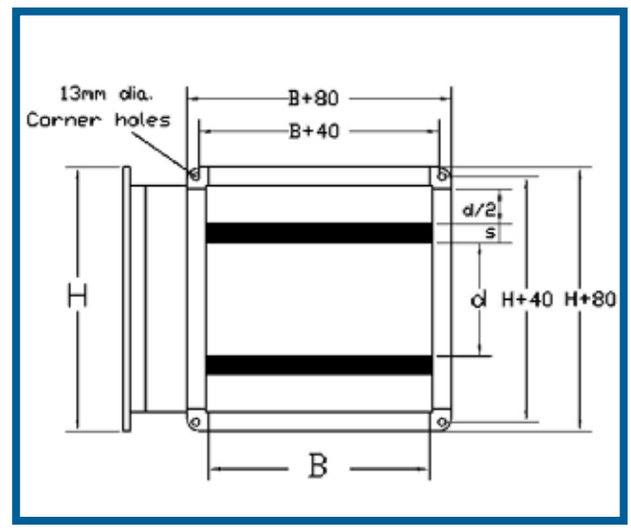
Dimension L, denotes the bend center path length which equates to the acoustic length referred to in the various selection tables.

Dimensions L1 and L2 refer to the air entry and discharge legs respectively, measured along outside of the bend.
Unless requested otherwise,bend attenuators would be supplied with L1 equal to L2.

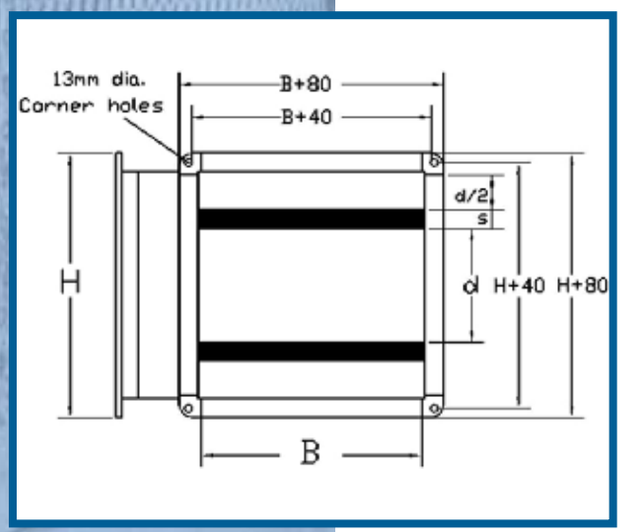
Bend attenuators can be designed for vertical or horizontal installation as shown below, to suit ductwork layout.

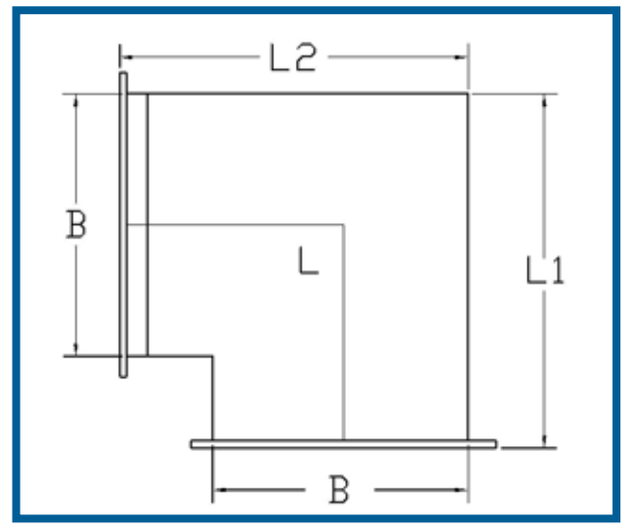
Vertical Bend Attenuator Type DSB

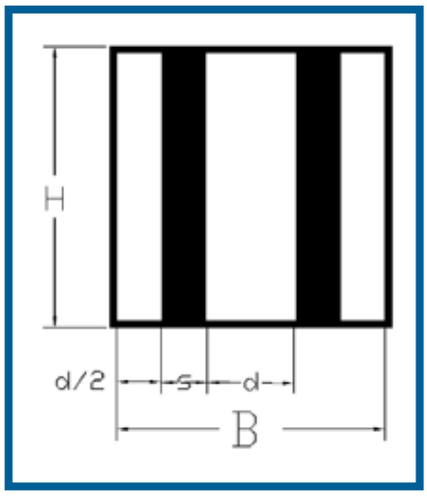


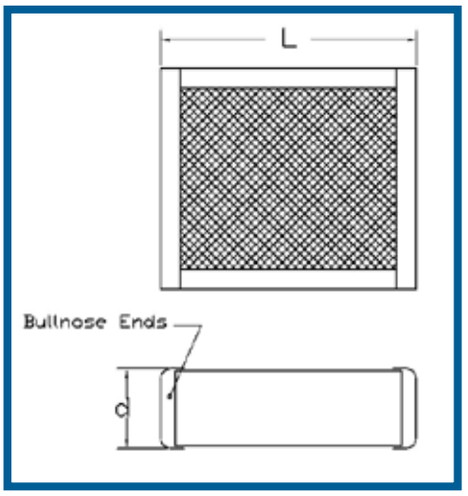


Horizontal Bend Attenuator Type DSBZ



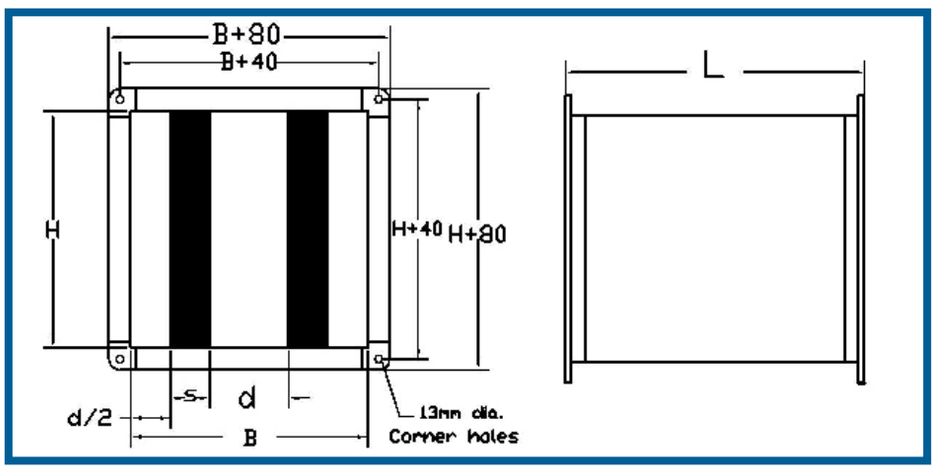






Splitters Type DK :

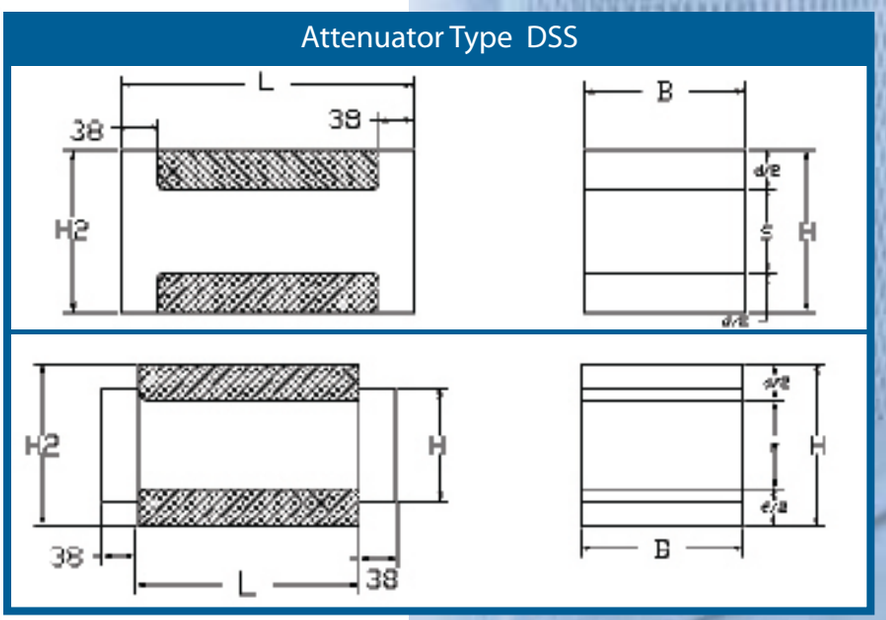
Where preferred, type DK splitters can be supplied for inclusion in an AHU section or builders work duct. Where required, airway spacer channels can be supplied.



Flangeless Construction:

For smaller ducts, attenuators can be supplied with spigot connections. DW142 recommends that the maximum duct size for this arrangement should be 400x400. The spigots may be straight through or stepped down. When stepped, dimension H must not be less than dimensions.
Flangeless attenuators are normally supplied with horizontal splitters but similar features can be provided with the splitters vertical.

Attenuator Type DSS



CALCULATION SHEET PRINTOUT

Roomside Sound Calculations

Options | Equipment Data | SUBMITTAL SETUP | Print

					Octave Center Frequency							
					63	125	250	500	1K	2K	4K	8K
Total Air Flow (M^3/s)												
Source Sound Pressure Level												
Smallest Ducts Dimension (mm)		Length (m)		-								
				-								
				-								
				-								
				-								
Radiussed Elbows Width (mm)		Qty.		-								
				-								
				-								
				-								
				-								
Additional Attenuations				-								
				-								
				-								
Critical Outlet Length (cm)		Width (cm)		-								
Outlet Sound Power Level												
Critical Outlet Flow (M^3/s)				-								
Dist. From Outlet To Listner (m)				-								
Directivity Outlet Location @	Center of Wall or Ceiling			+								
Direct Sound Power Level												
Total Flow to critical room (M^3/s)				-								
Room Area (m^2)		Height (m)		+								
Reverberation Time	1 Second			+								
Reverberant Pressure Level												
Combined Pressure Level												
Selection Criteria NC / NR / dBA	NC55				74	67	62	58	56	54	53	52
Add db As Safety Factor												
Calculated Insertion Loss												

Sound Attenuator Selection

Selection Insertion Loss — Insert Calculated Loss

Attenuator Type Suffix: O : Standard

Attenuator Material: O : Standard

Selection Criteria:
- (•) Min Pressure Drop
- ( ) Min Length

Max.Acceptable Pressure drop (Pa)	
Attenuator Air Flow (M^3/s)	
Attenuator Height (mm)	
Attenuator Width (mm)	

Attenuator Length (mm)	
Pressure drop (Pa)	

Sound Attenuator Selection

	Octave Center Frequency							
	63	125	250	500	1K	2K	4K	8K
Selection Insertion Losses dB								
Attenuator Insertion Losses dB								
Air Generated Sound Power Level								

Silencers
Attenuator Performance

Attenuator Performance	Description
DS attenuator have been rated, tested and derived from tests meeting the requirements of BS 4718: 1971 as tests conducted by SRL of UK. No deviations of insertion Loss with airflow were recorded over the range of velocities employed in this brochure. Pressure loss data assumes that the airflow to the attenuator is uniform over the face, in aduct-to-duct layout. Units installed in situations leading to poor inlet or discharge conditions could incur pressure losses higher than catalogued. In most applications the requirement to keep the pressure drop across the attenuator to a reasonable level automatically ensures that the flow noise generated within the attenuator is insignificant compared with the permissible sound power which emerges. If however, extremely low levels have to be obtained, or if the sound power from the fan is relatively low, the flow noise generated by the attenuator can be significant and can reduce its effective insertion loss. It is for this reason that when an acoustic consultant specifies the attenuator performance he will normally specify the insertion loss which is required. This then enables the attenuator manufacturer to select a unit of such a size that the flow generated within it will not reduce the effective insertion loss below the required level. Assuming correct installation, acoustic and aerodynamic performance of splitters only will be as for a cased attenuator.	Space noise levels can be affected by attenuator self noise. As a guide it is recommended that the face velocities indicated are not exceeded. For systems with fewer than three outlets or less than 5 m of ductwork, size for 5 NC lower. For design levels of NC 30 or below the selection should be checked

Required Space Noise Level NC	Maximum permissible Face velocity vt m/s			
	Attenuator type			
	DS20-75	DS20-100	DS20-150	DS20-200
25	2.4	3.2	3.9	5.0
30	3.2	4.2	5.5	6.2
35	3.8	5.0	6.7	7.4
40	4.6	5.7	7.7	8.9
45	5.4	6.6	8.6	10.4
50	6.2	7.6	9.7	11.6

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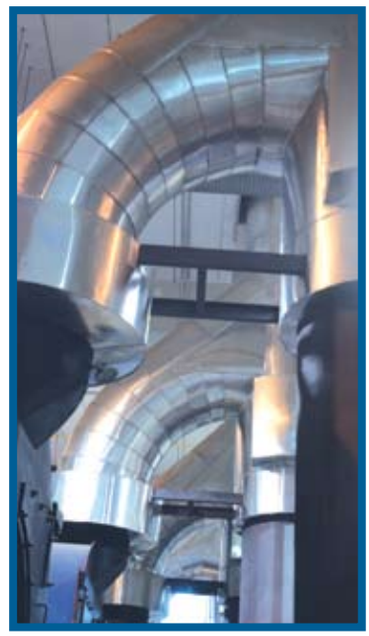
Silencers
Design Criteria

Recommended design criteria for various area functions

Situation	NC
Section 1 – Studios and Auditoria	
Sound Broadcasting (drama)	15
Sound Broadcasting (general), TV (general), Recording Studio	20
TV (audience studio)	25
Concert Hall, Theatre	20-25
Lecture Theatre, Cinema	25-30
Section 2 – Hospitals	
Audiometric Room	20-25
Operating Theatre, Single Bed Ward	30-35
Multi-bed Ward, Waiting room	35
Corridor, Laboratory	35-40
Wash Room, Toilet, Kitchen	35-45
Staff Room, Recreation Room	30-40
Section 3 – Hotels	
Individual Room, Suite	20-30
Ballroom, Banquet Room	30-35
Corridor, Lobby	35-40
Kitchen, Laundry	40-45
Section 4 – Restaurants, Shops and Stores	
Restaurant, Department Store (upper floor)	35-40
Club, Public House, Cafeteria, Canteen, Retail Store (main floor)	40-45
Section 5 – Offices	
Boardroom, Large Conference Room	25-30
Small conference Room, Executive Office, Reception Room	30-35
Open Plan Office	35
Drawing Office, Computer Suite	35-45
Section 6 – Public Buildings	
Court Room	25-30
Assembly Hall	25-35
Library, Bank, Museum	30-35
Wash Room, Toilet	35-45
Swimming Pool, Sports Area	40-50
Garage, Car Park	55
Section 7 – Ecclesiastical and Academic Buildings	
Church, Mosque	25-30
Classroom, Lecture Theatre	25-35
Laboratory, Workshop	35-40
Corridor, Gymnasium	35-45
Section 8 – Industrial	
Warehouse, Garage	45-50
Workshop (Light engineering)	45-55
Workshop (heavy engineering)	50-65
Section 9 – Private Dwelling (Urban)	
Bedroom	25
Living Room	30



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