


FreeTech

Acoustic & Noise Control Solutions Provider

FREEDOM TECHNOLOGY has the resources to provide acoustic and noise control services for industry on:



Building services noise control

Room acoustic treatment and sound insulation

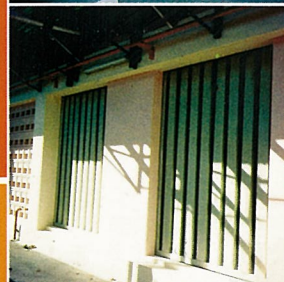
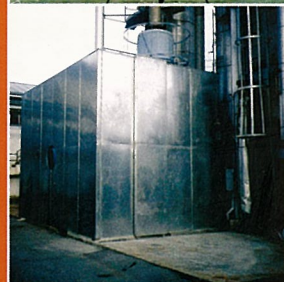
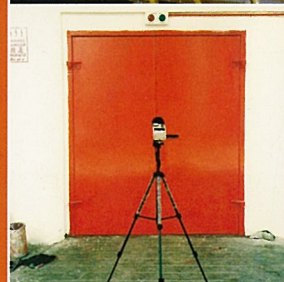
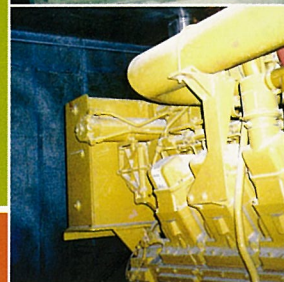
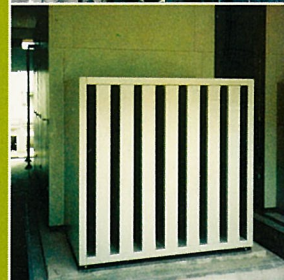
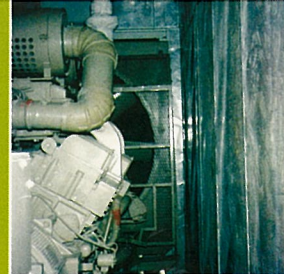
Building and architectural acoustics

Noise surveys, sound pressure levels measurement and industrial noise management

Preparing acoustic and noise control specifications and setting noise criteria standards

Assessment and recommendation on engineering noise control treatments suitable for compliance with environmental and occupational safety and health requirements

Design and build acoustics and noise control projects



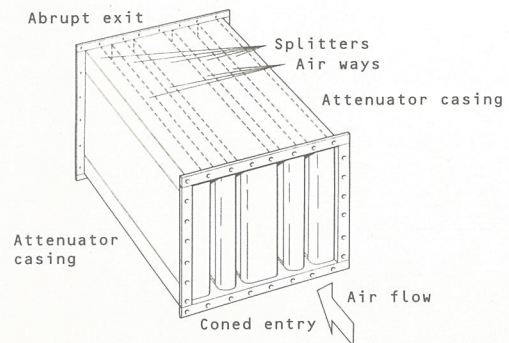
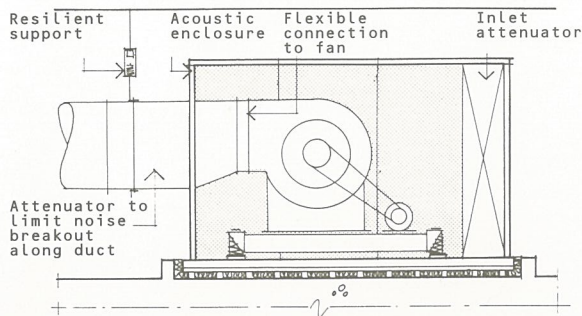
Freedom Technology Sdn. Bhd.

Rectangular Attenuator

Designed for optimum acoustic performance and minimum pressure loss to reduce ductborne noise transmission.

APPLICATIONS

- ☞ Plant rooms housing generators, compressors, pumps, boilers, turbines...
- ☞ Building ventilation and air-conditioning systems
- ☞ Enclosures and canopies for machineries



OUTLINE DIAGRAM OF ATTENUATOR

TYPICAL ACOUSTIC PERFORMANCE

Model	Length (MM)	Insertion Loss in dB								Standard Module Width (MM)	Approx Weight (kg/m ³)
		63	125	250	500	1K	2K	4K	8K		
20RA/10/90	900	3	8	16	30	38	32	26	18	300	135
20RA/10/120	1200	5	11	20	35	44	40	31	23		
20RA/10/150	1500	6	15	25	42	48	44	32	25		
20RA/10/180	1800	7	17	31	46	50	48	38	29		
20RA/10/240	2400	9	21	38	52	55	54	41	32		
20RA/10/300	3000	10	24	43	58	60	58	43	34		
20RA/15/90	900	3	7	13	21	26	21	16	11	350	115
20RA/15/120	1200	4	8	17	24	30	26	18	13		
20RA/15/150	1500	5	11	20	32	39	32	21	15		
20RA/15/180	1800	6	13	26	37	42	35	24	17		
20RA/15/240	2400	8	16	33	49	51	43	29	24		
20RA/15/300	3000	9	21	40	55	58	46	34	26		
20RA/20/90	900	3	6	12	20	23	15	9	8	400	100
20RA/20/120	1200	4	8	15	23	27	17	12	10		
20RA/20/150	1500	5	10	19	27	31	20	15	11		
20RA/20/180	1800	5	11	23	32	36	23	18	12		
20RA/20/240	2400	6	13	30	40	45	29	23	16		
20RA/20/300	3000	7	17	32	43	48	33	27	18		

QUICK SELECTION PROCEDURES FOR SPECIFIERS

- ☞ Establish the resultant noise level required
- ☞ Obtain noise level of the source
- ☞ Determine the noise level difference between the resultant and the source
- ☞ Match the attenuation required with the Insertion Loss (IL) of the selected attenuator
- ☞ Determine the attenuator size:
 - Decide the number of modules (width)
 - Calculate the height (H) of attenuator by using
 $Height = Air\ Flow / Face\ Velocity \times Width$

(Limit face velocity < 10 m/s to minimize flow generated noise)
- ☞ Detail engineering designs for checking allowable pressure drop, flow generated noise and possible noise breakout by FreeTech Engineering team

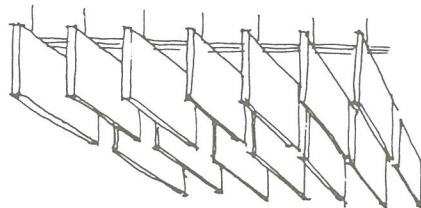
Noise Absorber &

Acoustic Panel

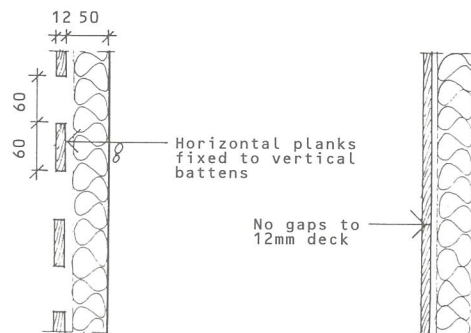
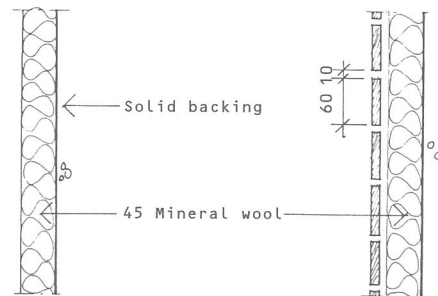
Used to modify the internal acoustic environment of buildings and factories by reducing the reverberant noise level. They are made of acoustically absorbent materials and can be either suspended from the ceiling/roof, formed part of the ceiling or fixed onto the surrounding walls.

APPLICATIONS

- ☞ Internal noise control and insulation for factories and workplaces
- ☞ Offices and conference rooms
- ☞ Libraries and sport stadiums
- ☞ Lecture theaters and auditoriums
- ☞ Recording studios and acoustic labs
- ☞ Plantrooms...



OVERHEAD NOISE ABSORBERS



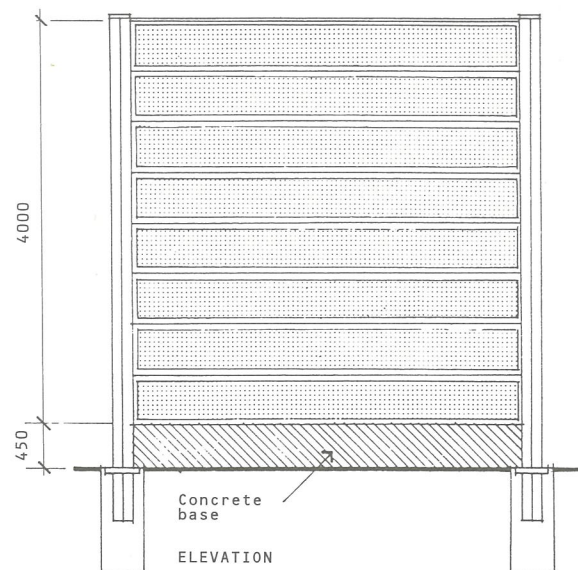
WALL PANELS

Noise Barrier

Used to interrupt noise transmission path between the noise source and the receiver. Designed with an acoustic infill absorption layer to produce a screening effect. Commonly installed either near the noise source or the receiver depending on the acoustic environment.

APPLICATIONS

- ☞ Perimeter fencing against noise from traffic, factories, power plants, equipments and machinery...
- ☞ Acoustic booths protecting employees from dangerous noise exposure



NOISE BARRIER

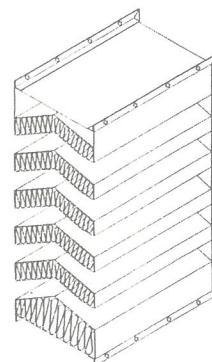
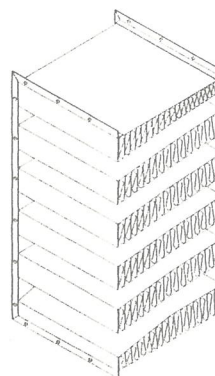
Acoustic Louvre

Used to handle large amount of air movement and at the same time reduce the noise level in a confined space installation. Can be used as a weather louvre where the external architectural finishing needs are to be maintained.

APPLICATIONS

- ☞ Plantroom ventilation
- ☞ Building and office ventilation
- ☞ Air-conditioning plantroom
- ☞ Cooling towers
- ☞ Enclosure and canopies...

MODEL ALY



MODEL ALX

TYPICAL ACOUSTIC PERFORMANCE

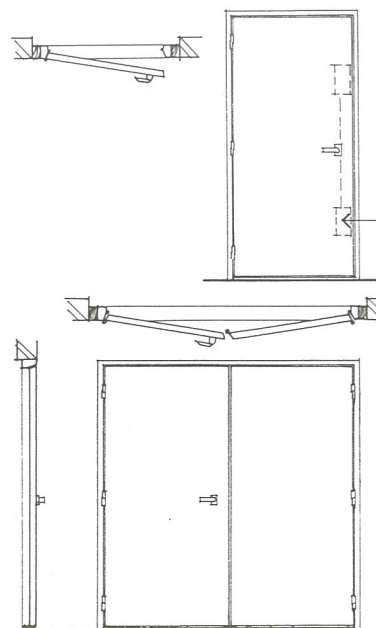
Model	Length (MM)	Insertion Loss in dB							
		63	125	250	500	1K	2K	4K	8K
ALX300	300	6	8	10	15	18	22	24	21
ALX600	600	6	10	14	22	32	42	43	39
ALY300	300	8	12	15	16	19	20	21	19
ALY600	600	8	13	21	26	32	32	29	26

Acoustic Door

Used for isolating high noise areas from the surrounding. Made by heavy gauge steel and offer fire resistant capability.

APPLICATIONS

- ☞ Generator room
- ☞ Air handling unit
- ☞ Compressor and chiller plant room
- ☞ Boiler and blower house
- ☞ Recording studio and broadcasting room
- ☞ Acoustic lab
- ☞ Control room...



CONSTRUCTION

- ☞ Heavy gauge sheet metal
- ☞ Stiffen internally
- ☞ Lined with heavy density acoustic infill
- ☞ Door frame and hinges
- ☞ Pull handle and lock

TYPICAL ACOUSTIC PERFORMANCE AND SPECIFICATION

Model	Thick-ness	Typical SRI in dB								STC	Single Leaf (MM)	Double Leaf (MM)	Approx Weight (kg/m²)
		63	125	250	500	1K	2K	4K	8K				
AD/75	75	15	27	32	36	37	41	43	44	36	900W x 2100H	1800W x 2100H	68
AD/100	100	20	30	34	39	44	46	46	47	39	1200W x 2100H	2400W x 2400H	72
AD/125	150	23	31	36	42	49	54	55	48	44			78

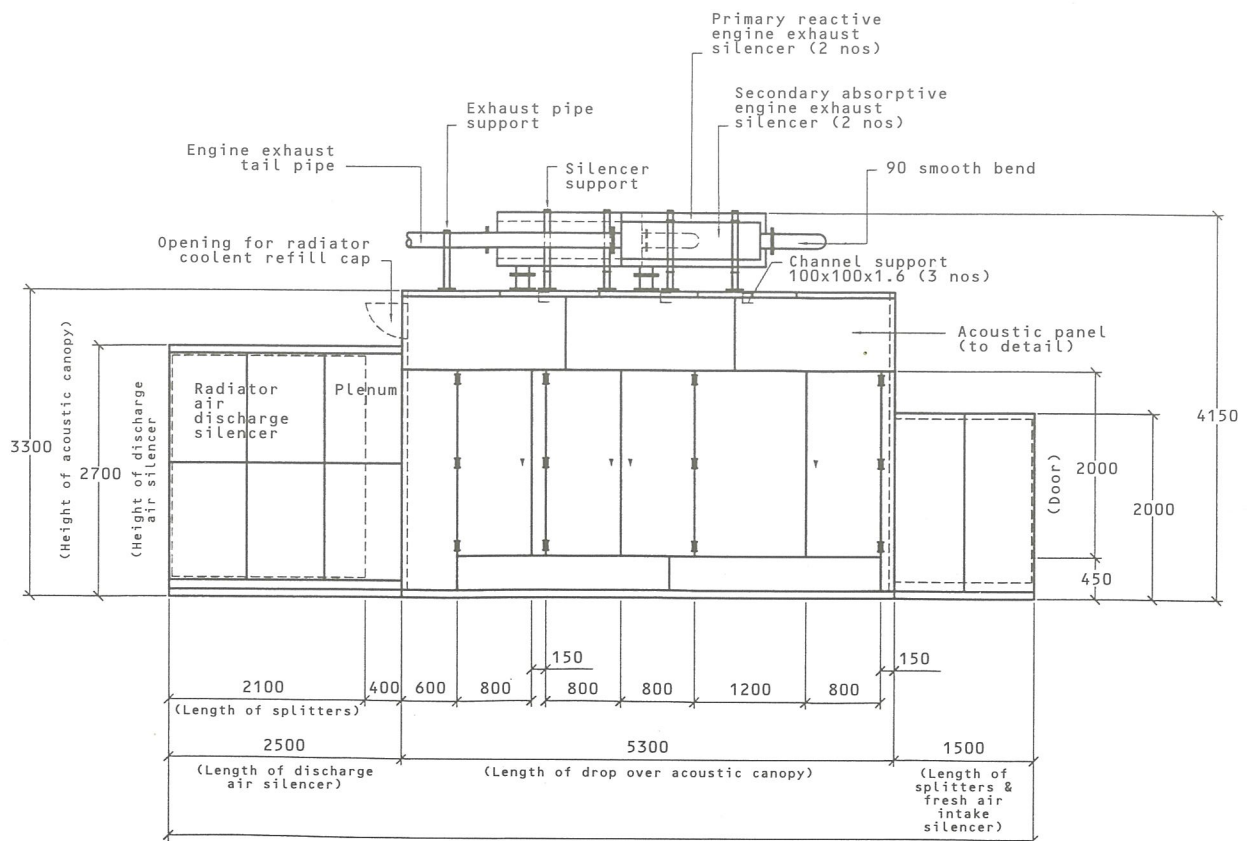
Acoustic Enclosure & Canopy

Employed to solve industrial noise at source and provide the greatest noise reduction potential of all the approaches to equipment and machinery noise abatement. Can be totally enclosed, weather-proof or partially enclosed and designs can be customized to suit site conditions.

APPLICATIONS

- | | | |
|--------------|-------------|-------------------|
| ☞ Press | ☞ Pump | ☞ Gas Turbine |
| ☞ Compressor | ☞ Blower | ☞ Motor and Fan |
| ☞ Generator | ☞ Test Cell | ☞ Noise Refuge... |

CONSTRUCTION



ACOUSTIC PERFORMANCE

Typical Insertion Loss of acoustic enclosure constructed of 1.2mm steel plate lined by 50mm thick of acoustic infill material

Hz	63	125	250	500	1k	2k	4k
dB	10	14	23	33	40	43	44

NON ACOUSTIC CONSIDERATIONS

- | | |
|-----------------------------------|------------------------------------|
| ☞ Ventilation and heat rejection | ☞ Vibration isolation |
| ☞ Operational accessibility | ☞ Lighting and safety requirements |
| ☞ Overall aesthetic appearance... | |

Exhaust Silencer

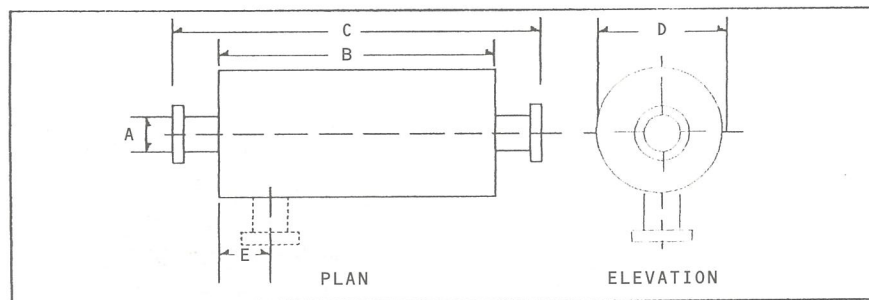
Used to reduce the intake air and exhaust gas discharge of internal combustion engines, vacuum pumps and reciprocating blowers....Designed to minimize the back pressure and hence reduce the power output loss of the machinery.

CONSTRUCTION

- (((Fabricated from HRCQ sheet metal with all welded construction
- (((Flanges are to BS Table C or ANSI requirements
- (((Drain plugs are fitted for removal of condensate
- (((External finish with heat resistant aluminium paint (600°C)

THREE MODELS ARE AVAILABLE

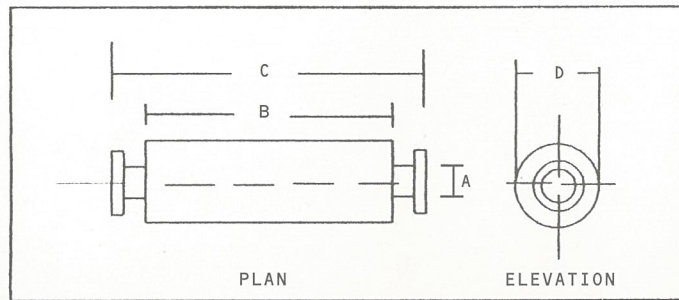
MULTI CHAMBER REACTIVE TYPE (USED AS PRIMARY STAGE SILENCER)



Pipe Diameter A	Dimension in mm					Weight kg
	D	End-Entry C	Side-Entry C	B	E	
100	400	1290	1215	1140	230	55
125	450	1550	1475	1400	230	80
150	550	1675	1600	1525	250	125
200	660	2005	1920	1830	300	190
250	760	2515	2430	2340	350	320
300	915	2920	2830	2740	400	465
350	1020	3475	3390	3300	450	640
400	1170	4035	3950	3860	500	910
450	1270	4470	4370	4270	550	1140

Frequency (Hz)	Typical Attenuation							
	63	125	250	500	1k	2K	4K	8K
dB	25	30	34	35	33	30	26	22

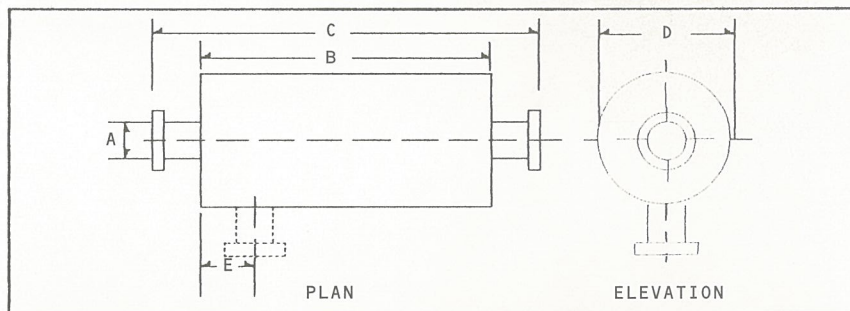
STRAIGHT THROUGH ABSORPTIVE TYPE (USED AS SECONDARY STAGE SILENCER)



Pipe Diameter A	Dimension in mm			Weight kg
	D	End-Entry C	B	
50	150	925	825	5
75	200	1075	975	15
100	225	1225	1125	27
125	225	1225	1125	35
150	380	1700	1500	60
200	450	1700	1500	80
250	550	2000	1800	115
300	650	2350	2100	180
350	7500	2500	2400	245

Frequency (Hz)	Typical Attenuation							
	63	125	250	500	1k	2K	4K	8K
dB	10	17	20	22	23	21	16	12

COMBINATION TYPE (USED AS SUPERCRITICAL SILENCER)



Pipe Diameter A	Dimension in mm					Weight kg
	D	End-Entry C	Side-Entry C	B	E	
100	450	1290	1215	1140	230	70
125	550	1550	1475	1400	230	95
150	600	1675	1600	1525	250	140
200	750	2005	1920	1830	300	215
250	850	2515	2430	2340	350	365
300	1020	2920	2830	2740	400	530
350	1120	3475	3390	3300	450	715
400	1270	4035	3950	3860	500	995
450	1470	4470	4370	4270	550	1250

Frequency (Hz)	Typical Attenuation							
	63	125	250	500	1k	2K	4K	8K
dB	25	30	34	35	33	30	26	22

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(ALL data and specifications are subject to change without prior notice)