

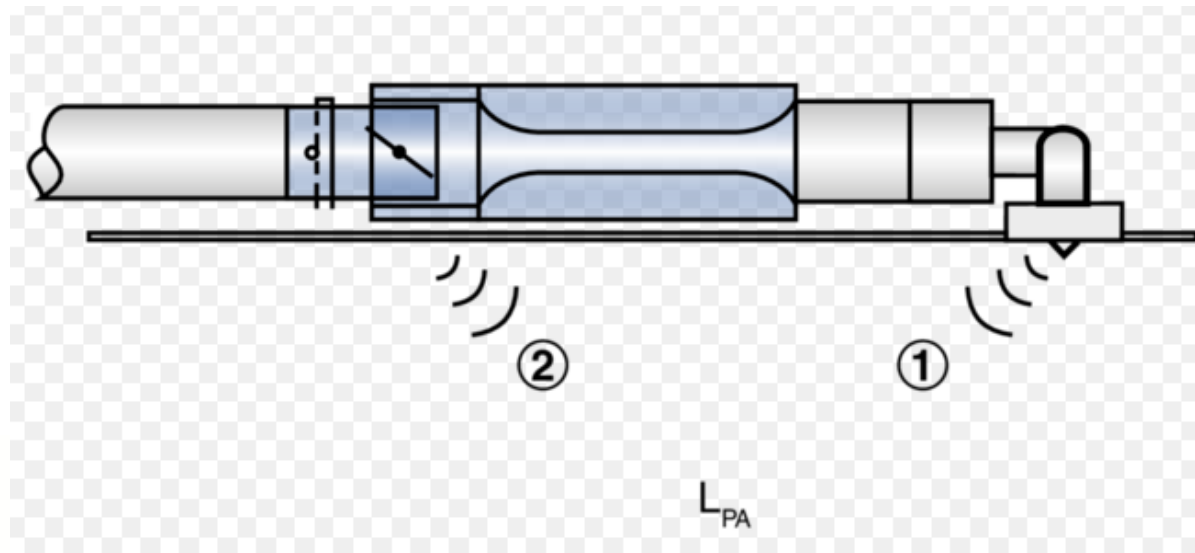
How to make your MVHR disappear



Sound Pathways

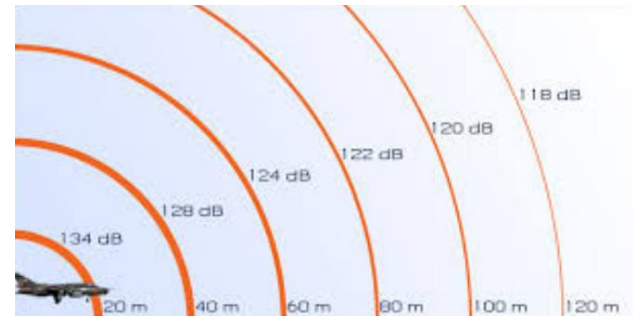
Two types

1. In-duct
2. Radiated or Break out



Two ways of presenting data

- Sound Pressure Level (SPL)



Sound Pressure Level decreasing with distance
MUST THEREFORE BE QUOTED WITH A DISTANCE TO SOURCE !!

- Sound Power Level (SWL)



Sound energy (per second) emitted
DOES NOT DEPEND ON DISTANCE TO SOURCE



dB v's dB(A)

- “A” weighting of sound data to make it more relevant to the human ear.



Which measurement to use?

- Not really critical which measurement type you use and long as it's consistent.



MVHR Sound Data

- **PHI noise targets for residential buildings**
 - Installed Room = 35dB(A) (*Radiated*)
 - Living spaces = 25dB(A)
 - Bathroom, laundry etc.(Functional spaces) = 30 dB(A)
- **UK Building Reg. limits for MVHR**
 - Bedrooms/ Living areas = 30dB(A)
 - Bathrooms/Kitchen = 35 dB(A)

These are sometimes given as Sound Pressure levels without any distance – So we are left to assume they are probably Sound Power levels!



MVHR Sound Data Example

Qv [m³/h]	Pst [Pa]	P [W]	L _w ¹ Supply air [dB(A)]	L _w ¹ Extract air [dB(A)]	L _w ¹ Unit emission [dB(A)]
200	25	17	52	42	39
250	50	37	56	44	42
300	50	55	58	46	45
315	50	61	59	46	45
350	100	94	62	48	48
400	100	121	64	50	51
450	100	152	67	52	53
350	150	110	63	49	49
350	200	127	64	50	51
400	200	156	67	51	53
450	140	166	68	52	54

L_w in dB(A) reference 10⁻¹²W, (Sound Power)



MVHR Sound Data Example

- PHI noise target for residential buildings
 - Installed Room Target = 35dB(A)
 - **Actual 42 dB(A)**
 - Acoustic separation from living / sleeping areas needed



MVHR Sound Data Example

- Living spaces = 25dB(A)
- **Actual 56 dB(A) – Silencer / Attenuator needed**
- Bathroom, laundry, Kitchen = 30 dB(A)
- **Actual 44 dB(A) – Silencer / Attenuator needed**



MVHR Attenuator options (also called Silencers)

- Attenuator A
 - Foil Skin 15 dB
 - Acoustic fill reduction
 - Diam 150 x 500mm
- Attenuator B
 - Steel Skin 15 dB
 - Acoustic fill reduction
 - Diam 150 x 500mm
- Attenuator C
 - Steel Skin 25 dB
 - Foam fill reduction
 - Acoustic Splitter
 - 500 x 500 x 230mm



Beware!

Silencer A Foil Skin

- Allows noise to breakout and will find its way back into down stream duct if not steel construction

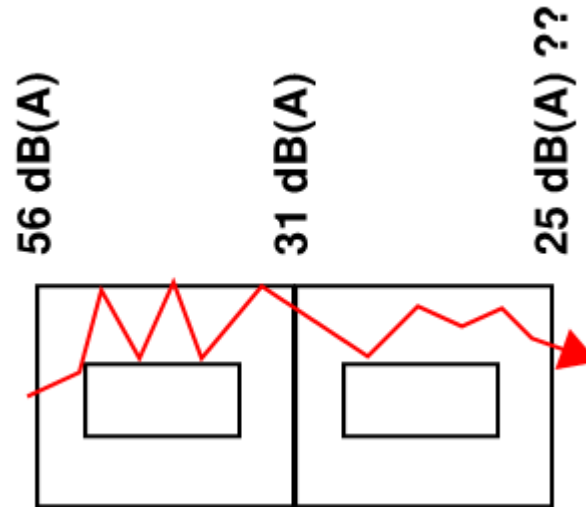


Expected 15 dB
reduction

Answer: Always use steel skin attenuators for reliable results!



Attenuation in Series



Remaining sound is largely travelling in direction of splitter / duct so secondary attenuation is very little. This applies to semi – rigid ductwork also!



MVHR Semi-rigid duct attenuation

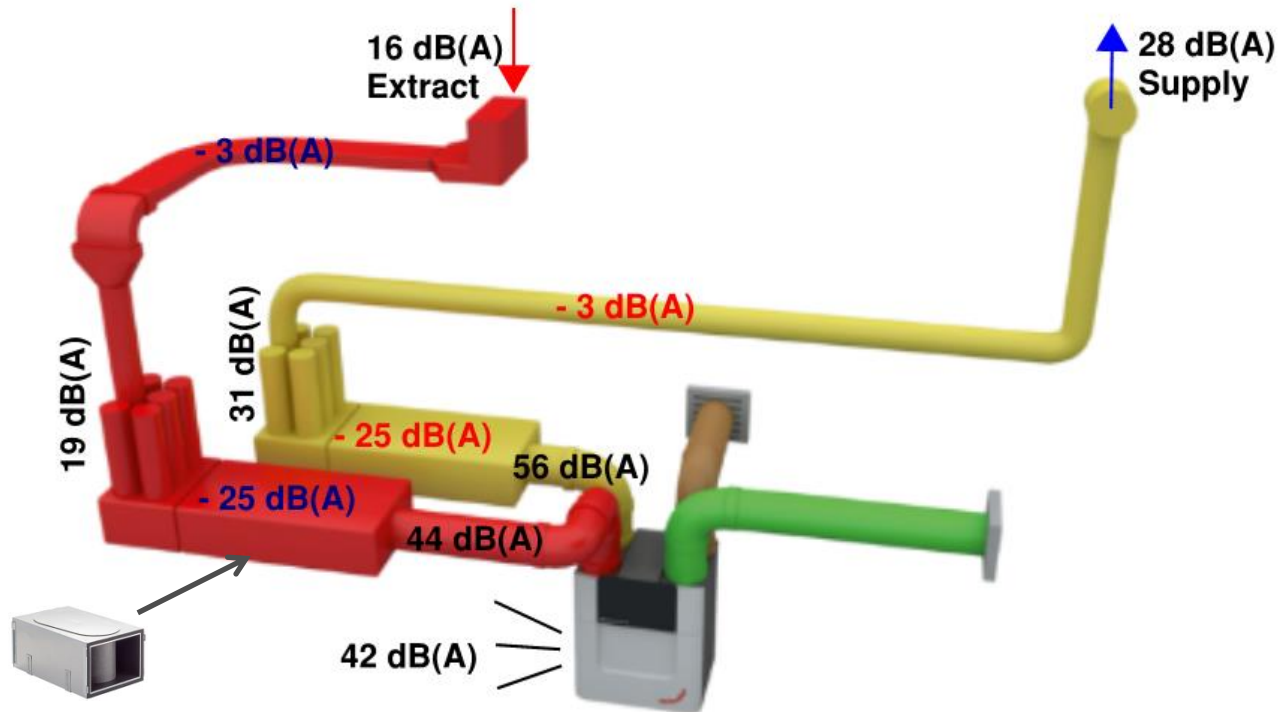
- **Semi Rigid Duct (75-90mm)**
 - Allow for 3 – 5 dB(A) max. sound reduction over duct run
 - More bends = more noise reduction
 - Straight duct has very little noise reduction

Octave range [Hz]	125	250	500	1000	2000	4000	
Attenuation of 1 m of ComfoTube 75 [dB]	0.4	0.6	0.4	0.2	0.3	0.1	
Attenuation of 1 m of ComfoTube 90 [dB]	0.4	0.5	0.3	0.3	0.4	0.7	= 1 dB reduction
Attenuation of 1 m of ComfoTube 110 [dB]	0.5	0.4	0.5	0.5	0.7	0.8	
Attenuation of 1 m of ComfoTube 125 [dB]	0.5	0.4	0.6	0.5	0.4	1.0	

This reduction is applicable for the 1st metre of duct but rapidly diminishing effect in subsequent straight runs!



Resulting Sound Power Levels



Difficult to achieve PHI supply air Sound Power Levels of 25 dB(A)!



Golden Rules for Vanishing MVHR's

- Minimise the source
 - **MVHR running at 50% of max volume at standard ventilation rates**
 - **Low pressure duct system**
- Use steel skinned attenuators
 - **Splitters are better (extra pressure drop negl.)**
- Must have 2 methods for air flow restriction
 - **At grille for fine adjustment**
 - **Induct for coarse adjustment (avoid grille whistle)**

