



HVAC fundamentals

Noise categories

Any moving or vibrating parts in a product can produce noise; this varies with the operation of the product. The noise is generated by the mechanical system i.e. the fan noise and can be classified into 5 categories.

Airborne

Radiated from the air handling unit/fan, the noise is transmitted through the air and directly through walls, windows, doors or ceilings into adjoining spaces.

Case breakout

The first type of break out noise is generated by high speed or turbulent air in ducts that cause the duct walls to vibrate and radiate a low frequency noise. The second is low frequency noise from a remote source, such as a fan in the AHU and can traverse down the duct into spaces or breaks out through the case or ductwork.

Duct-borne

Originated at a noise-generating source (i.e. the fan) the noise is carried down the ducted air path to receivers in rooms located remote from the source.

Self-generated

Produced as air moves through a confined duct system, noise is generated at points of turbulence such as dampers, elbows, T-junctions and air terminal devices. Self-generated noise increases with air velocity and the number of turbulent air points within a system.

Structure-borne

Generated from rotating or vibrating equipment such as framework or doors, which vibrates part of a building.

Noise

- Noise produced might be broadband, containing sound energy in several frequency bands, but no audibly distinct components in one frequency band.
- Noise that whines or hums at particular frequencies can produce an audible tone that can be annoying to the receiver.
- In ventilation the rotational fan speed causes an annoying low frequency hum between 100-250 Hz known as fan 'Blade Pass Frequency'.
- The fan 'Blade Pass Frequency' noise can be very intense – varying with the number of blades and rotation velocity.
- Understanding the noise sources and frequency pitches allows for a better understanding of how that particular noise will be transmitted in a real application.

VES Ltd

Eagle Close, Chandlers Ford Industrial Estate,
Chandlers Ford, Eastleigh, Hampshire. SO53 4NF

+44 (0) 2380 46 11 50 | Info@ves.co.uk | ves.co.uk | NC010519

