Noise: duct attenuators or silencers

EPA VICTORIA | Environment Protection Authority Victoria

VICTORIA State Government

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Hazard control guidance sheet

Using duct attenuators or silencers to eliminate or reduce the risk of harm from noise

Description

Duct attenuators, also called silencers, are used to reduce noise radiated from the inlet and the outlet of fans and other air handling equipment.

They are usually installed within the ductwork of heating, ventilation and air conditioning (HVAC) systems, and typically contain absorptive linings to attenuate the noise within the ducts.

Attenuators often include splitters, which split the ductwork into smaller airways, increasing the surface area for sound attenuation while still allowing air flow. In general, a longer attenuator will absorb more noise than a shorter one.

The final design of the attenuator will depend on the frequency (in Hz) of the noise being produced.

Figure 1. A circular attenuator on a rooftop.

Type of control

Physical.

When to use this control

Attenuators are typically seen within HVAC systems and air handling units.

Suitable for:

- exhausts or mobile plants
- air handling and ventilation systems
- cooling stacks
- air conditioning systems
- refrigeration units
- dust extraction systems
- vacuum pumps.

Industries that would use this: a range of industries. If your business or site produces noise from a HVAC system, then you could benefit from an attenuator.

Details and considerations

The addition of an attenuator can reduce noise emissions by up to 10-20 dB(A)*.

* A frequency weighting that represents the human response to sound and its frequency variation in a typical range of magnitude for environmental noise levels.

More information

See our website: **epa.vic.gov.au/for-business/find-a-topic/noise**

Contact us:
1300 372 842 (1300 EPA VIC) or
contact@epa.vic.gov.au

The actions you take and the controls you decide to implement will support you to comply with your general environmental duty and other duties under the *Environment Protection Act 2017*.

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Interpreter

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If you are deaf, or have a hearing or speech impairment, contact us through the National Relay Service. For more information, visit: **www.relayservice.gov.au**

Figure 2. A section of a rectangular attenuator showing externally positioned splitters.

Things to consider:
• Attenuators partially obstruct the flow of air through the ducting, which increases pressure on the HVAC system. When implementing an attenuator or deciding on the addition of a splitter, it is important to understand that attenuators may partially obstruct your ventilation system. This additional stress on your ventilation system, be it power requirements or pressure increases, should be considered to ensure that your system will not be impacted.
• There can still be break out noise (noise that escapes the system) and airflow within the attenuator can create some regenerated noise (additional noise), especially when airflow is turbulent. These additional noise sources from an attenuator can limit the final noise reduction achievable.
• Follow the manufacturer's instructions when installing an attenuator, to ensure it is effective.
• Discuss the attenuator design with an acoustic engineer/consultant prior to implementation. Attenuator design should factor in length, air velocity within the attenuator, splitters/design of splitters (tapered or straight), thickness of steel casing, and infill material required.
• Selecting an attenuator should consider the frequency of the noise, the total allowable pressure drop on the mechanical system, the site constraints and installation techniques. Performance of the attenuators may decrease over time as the silencer material becomes clogged with dust, grime or grease. Generally, the attenuator's silencing infill will be protected, or infill-free reactive silencers will be used in these applications. It is important to regularly maintain your noise reduction equipment and check its performance with on-site noise measurements periodically.
• In addition to attenuators, consider implementing barriers and enclosures (attenuators are generally required when implementing an enclosure), reducing fan speeds where appropriate, relocating fans or exhausts, ensuring equipment is properly maintained and that faulty equipment is replaced.

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Engaging an acoustic consultant

An acoustic consultant will typically be a person who is eligible for membership of the Australian Acoustical Society. The business a consultant works for will typically be a member of the Association of Australasian Acoustical Consultants.

See Work with an environmental consultant (EPA website) for general information about how to engage a consultant.

This control is an *example or option only* of what you could put in place to eliminate or reduce the risk of harm to human health and the environment. You can implement other controls, so long as you can demonstrate you have eliminated or reduced the risk of harm as far as reasonably practicable (EPA website).