

NOISE REDUCTION THROUGH ENGINEERING CONTROLS

The fundamental paradigm of toxicology, “the dose makes it a poison,” is equally applicable to noise exposure. The best way to prevent noise-induced hearing loss (NIHL) is to eliminate the noise or to reduce exposure to a level below the threshold of adverse effect. Such threshold can be assumed at 80 dBA (8-hour TWA), where the excess risk of hearing loss is not evident.

The exposure to noise is best reduced through engineering controls since individual hearing protection devices are prone to misuse rendering them ineffective. In the UK, it is a legal requirement to implement a programme of technical and administrative controls when daily exposure levels exceed 85 dBA.

Noise controls can be broadly divided into three groups:

- Noise reduction at source (reduction of source strength)
- Control of transmission path (reduction of energy in transmission)
- Control of noise exposure for the receiver (hearing protection devices)

Designing adequate noise controls is a complex issue requiring specialised knowledge of acoustics. The competency of an Occupational Hygienist is unlikely to be sufficient to design and implement effective noise solutions. It is common to purchase expensive and ineffective generic noise control solutions leading to waste of resources and minimal risk reduction. As such, it is essential to contract a qualified Acoustician to undertake a Noise Control Audit.

During the Noise Control Audit, the acoustics specialist examines the dominant sources of noise identified from your previous noise surveys. They undertake the octave band analysis on each noisy piece of equipment to understand the root cause of the noise. At the end, you are presented with a cost-benefit analysis informing you of potential noise reduction vs the cost of design and implementation.

Acoustics specialist will then undertake a more detailed analysis of those machinery and equipment selected for the noise reduction. A final report will present technical drawings and material specifications that will allow you to contract a local fabrication company that can manufacture and install the specified engineering solutions.

Such an approach ensures that the right competence is utilised at the right stage of a hearing conservation programme to ensure efficient risk reduction to workers' health with minimal waste of resources.

#Noise #Safety #Control #IH #OH #Health #Hearing

NOISE EXPOSURE REDUCTION - ENGINEERING CONTROLS

Item	Control option	Estimated noise reduction	Design Cost (excl. VAT)	Implementation cost
4.1	Laminar Flow Booths <ul style="list-style-type: none"> Strategically placed baffles and acoustic absorption 	5 – 10 dB(A)	£2240	< £500 materials + 0.5 man-day for installation
4.2	Pipework to Sump <ul style="list-style-type: none"> Changes to pipework arrangement 	~ 10 dB(A)	£1100	< £200 materials + 0.5 man-day for installation
4.3	PTS Vibration <ul style="list-style-type: none"> Local acoustic screening and damping Damping and cushioning of hopper/tank, if required 	> 5 dB(A)	£1980	< £1k materials + 1 man-day for installation
4.4	Refrigeration Units <ul style="list-style-type: none"> Acoustic screening, damping and absorption 	~ 8 dB(A)	£1980	< £1k materials + 1 man-day for installation
4.5	IPC Vent <ul style="list-style-type: none"> Quiet Fan technology (QFT) insert Acoustic insulation/local screening 	~ 6 dB(A)	£1980	£1k materials + 1 man-day for installation



Install acoustic insulation onto the ductwork and fan casing. Details of an effective insulation system is shown below.

The acoustic insulation should also cover all flanges, supports and couplings.

