



Simple 'quick win' moves to tackle industrial noise risk.

Tactical solutions that can reduce noise, enhance workforce safety and compliance.

Currently, 11m UK people are living with a hearing loss condition, 2m are thought to be exposed to noise at work which may be harmful, 500,000 have suffered hearing loss due to noise at work and 1.1m workers rely on PPE to prevent it responsibly.* However, tactical actions can reduce health and safety risk, quickly reduce industrial noise, generate real employee engagement benefits and are easy to execute.

Here are 10 simple noise control techniques that have wide application across multiple industries. In many cases, they could produce substantial noise reductions quickly and inexpensively – with little or no effect on normal operation or use.

1.) Damping (sound deadening)

What?	Chutes, hoppers, machine guards, panels, conveyors, tanks....
How?	Unconstrained layer usually bituminised (or similar) high damping material stuck to a surface or constraining (sandwiching or completely enveloping) a layer.
Limitations?	Effectiveness diminishes with thicker surfaces.
Desired effect?	5-25 dB reduction in the noise radiated (use a thickness that is 40-100% of the thickness of the panel / component to be treated).

2.) Fan installations

Applications?	Axial flow or centrifugal fans typically.
How?	A highly efficient fan is also a quiet fan. Any fan installation feature that tends to reduce fan efficiency is likely to increase noise. Two common examples are bends close to the fan (especially intake) and dampers too close to the fan intake or exhaust).
Solution?	Try to ensure there are at least 2-3 duct diameters of straight duct between any feature that may disturb the flow and the fan itself.
Desired effect?	3-12 dB are often possible of sound power.

3.) Ductwork

Applications?	Extraction, ventilation, cooling, openings in walls and enclosures...
Solution?	Replace silencers with lining in the last bend in the ductwork using acoustic absorbent (foam or rockwool –type material). Alternatively, construct a simple absorbent lined right-angled bend to fit on the opening. Ideally, either side of the bend be lined along a length equivalent to twice the diameter. When flow velocities are high (>3m/s), consider using cloth-faced absorbent. Duct vibration can usually be treated with damping.
Desired effect?	10-20dB reduction in airbourne noise

4.) Fan speed

Applications? Axial flow or centrifugal flow fans typically.
Solution? Fan noise is often proportionate to the 5th power of fan speed. In most cases, it is possible to achieve a large reduction in fan noise by a small drop in fan speed by changing control systems or pulley sizes or re-setting dampers.

Desired effect?

Fan speed reduction	Noise reduction
10%	2dB
20%	5dB
30%	8dB
40%	11dB
50%	15dB

5.) Pneumatic exhausts

Premise? A well-designed silencer will not increase system back pressure but avoid 3 common errors

How? (i) Fit a larger coupling and silencer
(ii) Use a straight-through silencer to avoid clogging (no back pressure)
(iii) Where multiple exhausts are used, manifold in to a single, larger diameter pipe

Desired effect? Up to 25dB

6.) Pneumatic nozzles

Applications? Cooling, drying, blowing ...

How? Replace existing nozzles for quiet, high efficiency units (entraining) which also use less compressed air

Desired effect? Up to 10dB

7.) Vibration isolation pads

Premise? Mounting motors, pumps, gearboxes and other items of plant on rubber bonded cork (or similar) pads can be a very effective way of reducing transmission of vibration and therefore noise radiated by the rest of the structure. This is particularly the case where vibrating units are bolted to steel supports or floors. However, a common error with the use of these pads is for the bolt to "short-circuit" the pad, resulting in no isolation. Additional pads must be fitted under the bolt heads as shown below.

Solution? Use rubber / neoprene or spring isolation pads. The type of isolator to specify will depend on multiple factors including the mass of the plant, the frequency of vibration to be isolated.

8.) Existing machine guards

Premise? Existing guards on many machines can often be improved to provide a significant noise reduction outcome. However, two solutions are nearly always inter-linked.

How? (i) Minimise gaps via flexible seals, additional close-fitting panels.
(ii) Use acoustic absorbent lining on the inside of guards which reduces noise 'trapping'. Tackle guard radiation via damping.

Desired effect? 3dB up to 10dB by minimising gaps alone.

9.) Chain and timing belt drives

Premise? Noisy chain drives can be replaced with quieter alternatives.

How? Quiet-engineered drive belts exist employing different tooth profiles to minimise noise. There are also new-generation belts for applications where noise is critical to operating using a chevron pattern for very quiet running.

Desired effect? 6-20dB noise reduction

10.) No regrets - Remote monitoring and better decision-making

Premise?	There is a link between workforce productivity, wellbeing, how site workers are made to feel on site and communication. Employers who practice this in the face of the work force, through eDisplays and Smart Monitoring and communication, are often those who are able to demonstrate exceptional levels of site efficiency, a competitive advantage and demonstrably strong Health & Safety ethics.
How?	Smart noise and safety management signalling and compliance system that supports workforce communication, lowers absenteeism, risk of hearing loss and can contribute to lower insurance premiums.

The SonoLab advantage

- SonoLab are specialists in industrial acoustics and engineering-out noise. We ensure sound compliance and have supplied companies with effective solutions all over the world
- SonoLab provide a complete sound compliance offer from consultancy, protection (design & install), to remote monitoring and compliance
- Customers receive deep sector knowledge, quick wins without compromise
- Our instant-fit custom-moulded earplugs are pioneering (200,000+ units sold worldwide)
- Our engineering-out noise approach is creative and highly effective
- Our remote monitoring and 24/7 dashboard supports better decision-making and adds demonstrable transparency of site and operating compliance

About SonoLab

SonoLab are hearing loss prevention and compliance specialists. We supply high quality consulting and practical engineering across industrial acoustics, noise management and protection (design and install). We specify and fit remote monitoring, eSigns and smart dashboards which help you monitor site compliance and demonstrate safety. Our focus is on sound compliance and prevention of hearing loss through work-induced noise. We engineer-out noise. We also pioneered and supply Instant Fit Custom-Moulded earplugs for customers around the world.

Further information

By visiting the SonoLab website at www.sonolab.com, you can learn more and get free downloads. Read about **strategic considerations – do I have an industrial noise issue and what am I expected to do about it** (Fact Sheet). **Discover how to model industrial noise** (Fact Sheet). Share pictures and / or video and **ask for remote noise risk support** or a **free site survey** (90 minutes).



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*www.hse.gov.uk/vibration/hav/roadshow/al7.pdf, www.actionhearingloss.org.uk

In accordance with best principles recognised by IOA, BSI and standards set out in BSEN ISO17025.