Use engineering controls to help protect your workers' hearing.

While providing earplugs or earmuffs is helpful, it's not the most effective way to prevent hearing loss in the workplace.

According to the Occupational Safety and Health Administration (OSHA), as many as 22 million workers in the U.S. are exposed to potentially damaging noise in the workplace each year.[1]

A common response when a business has a noisy work area is to provide workers with hearing protection devices like earplugs or earmuffs. While wearing these is better than working unprotected in a noisy environment, our experience at Nationwide® tells us a more effective way for businesses to protect their workers' hearing is to use engineering controls whenever feasible.

In the U.S., OSHA has established a permissible exposure limit (PEL) for noise of 90 dBa (decibels). Employers must limit the 8-hour time-weighted average (TWA) noise exposure of employees to 90 dBa or below, and engineering controls can help to achieve that goal.

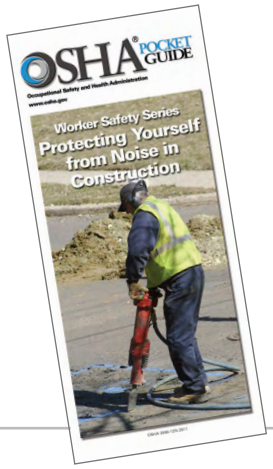
[1] "Occupational Noise Exposure," U.S. Department of Labor—Occupational Safety and Health Administration, osha.gov/SLTC/noisehearingconservation/ (downloaded Aug. 6, 2018)

Nationwide® is on your side

See the following pages for practical steps your business can take.

OSHA's handy guide for you and your workers.

To reinforce the importance of the proper precautions employers and employees can take to help prevent hearing loss, give your workers a copy of OSHA's Pocket Guide: Worker Safety Series — Protecting Yourself from Noise in Construction. Although the brochure focuses on construction, the same principles apply to workers in other industries, as well.

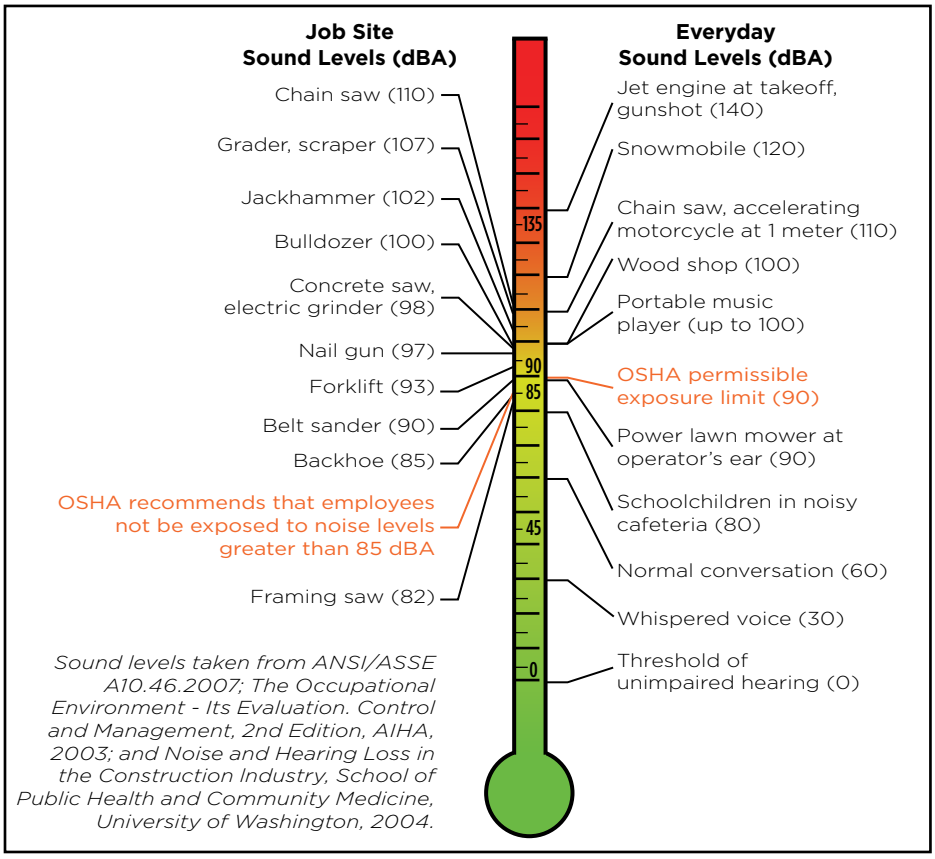


How loud is too loud?

In its publication, Pocket Guide: *Worker Safety Series — Protecting Yourself from Noise in Construction*, OSHA uses the chart shown below to summarize the noise levels produced by various sounds heard on a job site and in everyday life.

On the following pages, we highlight practical steps your business can take to keep the noises your workers hear at or below OSHA's permissible exposure limit of 90 dBa. Keep in mind that the solutions presented apply not only to construction, but also to manufacturing and other industries where high levels of noise are present in the workplace.

OSHA Sound Level Chart[2]



[2] Source: U.S. Department of Labor

How engineering controls are applied.

Engineering controls involve modifying the equipment, process or environment in some way so that less sound energy is created or is transmitted to workers. Often, the most effective approach is to identify and treat the source of the noise. Limiting noise exposures to workers can be accomplished by applying engineering controls to the noise source, the noise path and/or the receiver.

- **Source:** An object, machine or tool that creates vibrations during operation that radiate into the work area as noise
- **Path:** How noise travels — not only through the air, but also through solid materials such as floors, walls and windows
- **Receiver:** In any hearing conservation program, the worker

Methods of engineering controls.

Once the source, path and receiver have been recognized, engineering controls can be used to reduce the impact of unwanted noise in the following ways:

- **Modification** — Changing a process to make it less noisy

  Example: Decreasing the distance that parts must drop into a bin so less overall noise is created

- **Substitution** — Replacing or modifying components of a noisy system

  Example: Switching to a quieter air nozzle or replacing steel wheels on a cart with low-noise rubber wheels

- **Vibration isolation** — Springs, foam or other damping materials used to reduce the transmission of sound from noise sources to floors, walls or connected equipment
  - Commonly used for heavy machine tools, process equipment, large ventilation generators, pumps and instruments that require isolators for noise, shock and vibration control
  - Materials usually fabricated from neoprene, fiberglass or a combination of metal and springs isolators

  Example: Springs on each support of a floor-mounted motor to lessen the sound energy that's passed into the floor and the rest of the building

- **Damping** — Placing materials such as foam, resin or tape on an object or modifying it so that it vibrates less
  - Can also be used to reduce airborne noise regenerated by the vibrating surface
  - Products available in adhesive-backed sheets or in a compound form that can be sprayed or troweled directly onto the vibrating surface

  Example: Coating the outside of a metal bin with resin to reduce the vibration made when parts are dropped into the bin

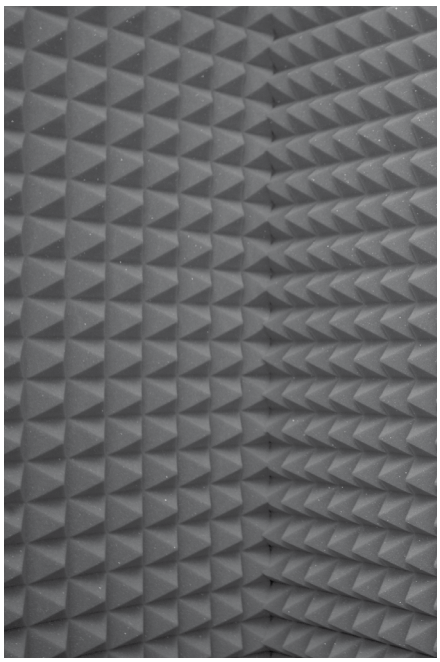
Apply engineering controls to the source, the path and/or the receiver to reduce the impact of unwanted noise.

Questions? Contact Nationwide Loss Control Services: 1-866-808-2101 or LCS@nationwide.com.

- **Barriers** — Reflectors or partitions placed in the sound path to deflect sound away from employees or enclose noise sources
  - Reduces airborne noise transmission
  - Can be fabricated from fiberglass (faced and non-faced) foam or vinyl materials

  Example: Placing a wall or enclosure around a compressor so employees can work nearby with less direct noise exposure
- **Absorption** — Sound-absorbing materials placed in an area to reduce the reflection and buildup of sound
  - Can be wall and/or ceiling-mounted panels, baffles, curtains and/or blankets fabricated from fiberglass (faced and non-faced) foam or other materials
  - Offers reverberant noise control by absorbing sound waves that strike the surface of the material

  Example: Acoustical tiles placed on a solid surface to lower sound reflection in a room



Sound-absorbing materials may help to reduce the reflection and buildup of sound.

Additional tips for reducing noise.

- Maintain tools and equipment (such as lubricating gears, replacing gaskets, etc.)
- Reduce vibration wherever possible
- Modify the work process or production method, such as changing speed, pressure, mechanical controls or the direction of air flow
- Enclose the noise source
- Isolate the employee from the noise source by having him/her work in a soundproof room or booth
- Retrain employees to use tools or complete tasks in ways that create less noise

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Providing solutions to help our members manage risk.®

For your risk management and safety needs, contact Nationwide Loss Control Services: 1-866-808-2101 or LCS@nationwide.com.