



DO WE HAVE A PROBLEM WITH WORKPLACE NOISE?

STANDARDS, SAFETY, AND BEST PRACTICES

I SUSPECT NOISE PROBLEMS IN MY WORKPLACE... WHAT SHOULD I DO?

You may have heard that OSHA is renewing emphasis on hearing conservation programs in your area. You may have recently learned an employee is suffering from hearing loss. Maybe you are simply an employer who wants to take good care of your employees. Whatever your motivation for learning more about the dose of noise experienced by individuals in your facility, we're here to help. Assessing the level of noise in your workplace is the first step. Understanding the noise level by measuring your employees' exposure (known as noise dose) provides the pathway toward mitigating the effects of hazardous noise.

What is Noise Dose?

Noise dose is simply a way to measure the amount of exposure to sound an individual receives in a given time period. At its simplest, it is a function of the noise level experienced and the amount of exposure time. It is



expressed in the form of a percentage of total allowable exposure. If the worker is exposed to varying noise levels throughout the day (perhaps they move around from station to station or different equipment is running at different times), it is convenient to measure noise dose with a personal noise dosimeter. Without a noise dosimeter, computing overall noise dose for varying noise levels is complicated; due to their logarithmic nature decibel levels cannot be simply averaged.

How Do I Determine If My Employees' Noise Exposure Level is Safe?

The first step when a noise problem in the workplace is suspected is to perform a sound survey. The simplest way to accomplish this is to measure with a handheld, calibrated sound level meter at various locations. The sound levels of potential problem areas may be plotted on a noise survey map. If any area measures over 80 to 85 dB, further investigation is recommended. (If measuring with a less accurate device, for example a cell phone app, consider further measures if the noise level in an area measures over 75 dB.)

If an individual worker is stationary all day, a sound level meter can also be used to measure noise levels and calculate dose. A Sound Level Meter designed specifically for the Occupational Health and Safety professional may have built-in functionality to calculate and display noise dose. If the meter does not make the dose calculation, there are methods to calculate dose by hand.



However, for anyone moving around to areas with varying noise levels, a personal noise dosimeter, a small badge-type device worn by the employee during a typical work day, is the simplest and least obtrusive option for directly measuring noise dose. A noise dosimeter with built-in bump and motion detection plus sound recording option helps ensure you're getting data that represents the actual dose being received by the person wearing it

Which Workplace Standard Do I Need to Follow?

Allowable noise dose is not universally agreed upon. There are unique standards in place in the EU, the US, Canada, Australia, and elsewhere. Zero represents no exposure and 100 or more represents “complete” exposure, but that 0-100 means something different depending on which standard is being used for measurement.

| | OSHA-PEL | OSHA-HC | ACGIH | NIOSH | Custom |
|-----------------------|----------|----------|----------|----------|---------------|
| Mode | Dose | Dose | Dose | Dose | Dose or ISO |
| Exchange Rate | 5 | 5 | 3 | 3 | 3, 4, 5, or 6 |
| Criterion Level | 90.0 | 85.0 | 85.0 | 85.0 | User selected |
| Threshold Enable | Enabled | Enabled | Enabled | Enabled | User selected |
| Threshold | 90.0 | 80.0 | 80.0 | 80.0 | User selected |
| Shift Time | 8.0 | 8.0 | 8.0 | 8.0 | User selected |
| Frequency Weight | A-Weight | A-Weight | A-Weight | A-Weight | User selected |
| Detector | Slow | Slow | Slow | Slow | User selected |
| Peak Frequency Weight | C-Weight | C-Weight | C-Weight | C-Weight | User selected |

Spartan Workplace Noise Dosimeter includes built-in measurement settings for common workplace noise standards. Custom settings also available. See [Workplace Noise Dosimetry Glossary](#) for more information on Exchange Rate, Criterion Level, Threshold, and more.

Each standard makes certain assumptions, including:

- The level of noise that makes a meaningful contribution to noise dose
- The level of noise and time of exposure that is dangerous or damaging to human hearing

What does this mean to you? When measuring with a personal noise dosimeter, all you need to know is the specific noise standard for your location or situation. In the United States, most workplaces are obligated to comply with OSHA-PEL noise exposure limit. In Europe, workplace noise falls under EU Directive 2003/10/EC.

Larson Davis’ Spartan™ Workplace Noise Dosimeter makes it easy to comply with a wide variety of standards including

- OSHA-PEL
- OSHA-HC
- MSHA
- NIOSH
- ACGIH
- ISO 9612
- EU Directive 2003/10/EC

Although you may be required to comply with a less conservative standard such as OSHA-PEL, there is ample evidence that a daily noise dose much lower than allowable by OSHA-PEL can damage hearing. For example, the professional association American Conference of Governmental Industrial Hygienists (ACGIH) makes its own recommendations via their standard. Spartan Noise Dosimeters allow you to measure to several standards at once with its four virtual dosimeter displays. Consider looking at the data from several different measurement standards to better understand the wide range of levels considered legal, safe, or acceptable.

Preparing for Measurement

Once you understand the appropriate standard, measuring worker noise dose is easy.

- Charge the noise dosimeter right in its case on the charging pad
- Set up the measurement from your mobile device with the LD Atlas™ app
- Calibrate dosimeter by placing the calibrator over the microphone and pressing a button to start the tone. Accept calibration adjustments.
- Clip the dosimeter to the worker’s clothing at the shoulder. The microphone should be as close to the ear as physically possible.
- Begin the measurement automatically by setting a run time in setup, from the device itself, or from your nearby mobile device. End the measurement the same way.

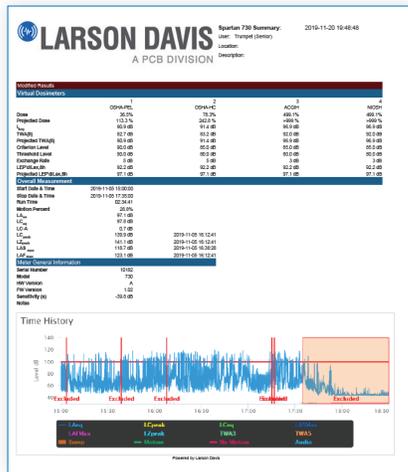
Post-Measurement

Results are displayed as a percentage indicating how much of the employee’s daily allowable noise dose they received during the measurement. If the measurement period was less than a typical workday, the P.Dose (projected dose) indicates how much dose that individual would receive over a full work day if the pattern of noise continued all day.

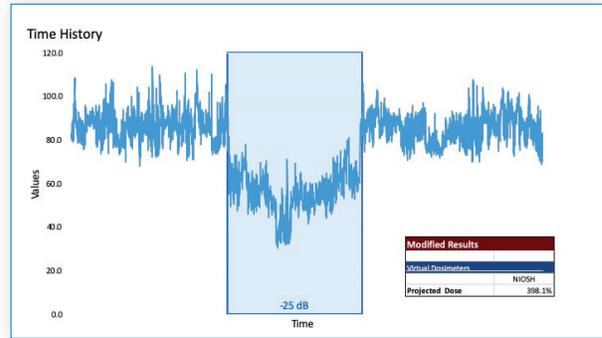
Making Reports

The critical information is the standard used and the percent dose, both clearly displayed on your screen and in reports. You can learn more about some of the other parameters displayed by looking at our [Noise Dosimetry Glossary](#).

Making Reports: With a few clicks in the app, easily generate and email a pdf report of results.



Using Noise Measurements to Plan Noise Controls

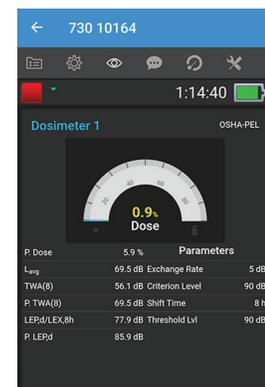
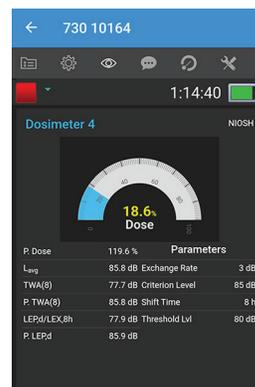


If you have determined that you need to implement controls to protect your employees' hearing health, included software analysis tools make it possible to “try out” various options to determine which options might work best for your individual situation. Working with your measurement file, you can select a time period and experiment with hypothetical scenarios. For example, to see how utilizing PPE or noise barriers that reduce noise overall by 10 dB, select the entire measurement period and offset the measurement by -10 dB. The measurement summary re-calculates exposure with the new data, while preserving the original data for comparison. You can also experiment with reducing noise level in just a portion of the time period to see the effect of administrative controls, in which workers are moved to a quiet environment for a certain period of the work day. Learn more about this process in the article [“Using Noise Compliance Measurements to Plan Noise Controls”](#) from Industrial Hygiene in the Workplace.

What's Next?

If your measurement finds that employees in your facility are experiencing an unsafe dose of noise, the next step is to implement a plan.

- Reduce the effects of noise with:
 - Engineering Controls
 - Isolate loud equipment (barrier between employee and equipment)
 - Utilize sound absorption panels
 - Utilize low-noise tools
 - Maintain and lubricate machinery and equipment
 - Administrative Controls
 - Rotate workers to quieter equipment
 - Personal Protective Equipment
- Continue to monitor and measure noise dose on a regular schedule
- Annual hearing exams for workers may be required



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