

# THE 2023 COMPLIANCE ISSUE

On the following pages, find information that assists OHS professionals in keeping workers safe and helps companies stay in compliance with standards pertinent to the field of industrial hygiene & safety.



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# Hearing Protection Training: A Deep Dive into Standard 1910.95(a)



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“The OSHA 1910.95 standard provides necessary procedures to ensure safety from occupational noise exposure. Spartan product line by Larson Davis promotes hearing safety with accurate noise measurements, simplifying OSHA 1910.95 compliance and helping employers maintain hearing health in the workplace.” *Dan Wilding, Larson Davis, <https://larsondavis.com/applications/industrial-hygiene/spartan-series>, 716-926-8243*

The Occupational Noise Exposure mandate (OSHA’s 29 CFR 1910.95) requires employees exposed to 85dBA TWA be enrolled in a Hearing Conservation Program (HCP). Employers are required to ensure employees participate in hearing conservation training for the duration of their employment. This should begin with initial orientation training, followed by annual reinforcement.

Section 1910.95(a) part of the standard initiates and establishes a hearing conservation program to protect personnel from the effects of occupational noise exposure. Here is a short look at the “what,” “who,” “how” and “when” of hearing conservation implementation.

### WHAT SHOULD BE TAUGHT

OSHA’s CFR 1910.95 includes specific guidance as to what topic areas must be covered annually. The required topics can be broken into three groups of information:

1. The effects of noise on hearing
2. The purpose of hearing protectors; the advantages, disadvantages and attenuation of various types; and instructions on selection, fitting, use and care
3. The purpose of audiometric testing and an explanation of the test procedures

### WHO SHOULD BE TRAINED

According to audiologists Dr. Vickie Tuten and Dr. Kathy Gates, all employees exposed to 85dBA TWA, for even one day, need to be enrolled in the HCP. 85dBA TWA is referred to as the action level (AL) under OSHA. The program must have, at a minimum, annual testing, annual training and available hearing protection to enrolled employees. When employees reach the Permissible Exposure Limit (PEL) of 90dBA TWA, hearing protection is mandated. Annual education and training remain a constant throughout, once the AL is reached.

### HOW TO CONDUCT TRAINING

Industrial hygienists are in a perfect position to provide formal training and impromptu education, when conducting area monitoring or dosimetry. Formal training should always be documented and records maintained, in case of an audit. Informal or impromptu education serves as great reinforcement to remind workers of the importance of adopting good hearing conservation practices, noted Drs. Gates and Tuten.

The training element is flexible and allows for creativity to be incorporated into the process. When you break the topics into the three groups of information listed above, the primary focus of the industrial hygienist would be to provide training on the “effects of noise on hearing” and “all things hearing protection.”

The third required topic, “purpose of audiometric testing and explanation of test procedures,” should be provided by the hearing technician at the time of the hearing test. The topic “effects of noise on hearing” can be delivered at any time. This could be covered during a formal training session or shared with workers while visiting individual worksites. Informal education sessions are “excellent opportunities to discuss the noise hazards being heard in participants’ workplaces; how unprotected exposures to this noise hazard may result in a permanent injury/illness; and how properly worn hearing protection can mitigate the risk of a permanent hearing loss,” stated Gates and Tuten.

### WHEN TRAINING SHOULD OCCUR

HCP training must be completed annually, and employers must ensure employee participation. The education and training element allows flexibility for the employer to provide the training at different times throughout the year, by any HCP team member. “There is not a requirement to discuss all mandated education and training topics in a single event; however, the mandatory topics need to be covered and employee attendance rosters maintained,” Drs. Tuten and Gates concluded. **IHW**

*[Editor’s note: Much of the material used in this article first ran in IHW’s March/April 2021 issue in an article titled “Now Hear This: Right Steps for Hearing Conservation Training.” For the entire article, go to <https://industrialhygienepub.com/hearing-now-hear-this-right-steps-for-hearing-conservation-training/>.]*



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# OSHA's National Emphasis Program—Outdoor & Indoor Heat-Related Hazards

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“Heat stress related injuries can occur under almost any scenario and can be dependent on many external factors along with the health/fitness of the individual. One important preventive measure often overlooked is proper hydration. Implementing this National Emphasis Program using a healthy hydration approach encourages workers to drink more water and ultimately saves lives.” *Janet Baker-Truex, CEO, Nextteq International LLC, [info@nextteq.com](mailto:info@nextteq.com), [www.readygohydration.com](http://www.readygohydration.com)*

## Background & History

On a warm, summer day in July, a 42-year-old man was on his way to work for his new job as a roofer. When he arrived, there was plenty of water, ice and drinks available at the site for him to hydrate throughout the day. It was only his third day on the job, and he got straight to work. The high temperature was about 86°F and a relative humidity of 57%, for a heat index

of 90°F. Later that afternoon, the man told his colleagues he wasn't feeling well. He climbed down from the roof and sat out of the sun. When his co-workers checked on him a few minutes later, he had developed symptoms of heat stroke. He was taken to nearby hospital where he died shortly after. (See *OSHA's case studies at the end of this article.*)

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Cases like the one above demonstrate why the Outdoor and Indoor Heat-Related Hazards standard and the National Emphasis Program (NEP) are so important to keeping workers safe. The NEP protects employees from heat-related hazards and the resulting injuries and illnesses in outdoor and indoor workplaces. The standard expands on the agency's ongoing heat-related illness prevention initiative and campaign by setting forth targeted enforcement components and reiterating its compliance assistance and outreach efforts. This tactic is intended to urge early interventions by employers to prevent illnesses and deaths among workers during high heat conditions, such as working outdoors in a local area experiencing a heat wave. Early prevention measures include implementing water, rest, shade, training and acclimatization procedures for new/returning employees.

## Importance of Standard

Millions of American workers are subjected to heat in their work environment and, even though illness from heat exposure is preventable, every year thousands become sick from occupational heat exposure. And, as noted in the above case study, some exposures can be fatal. According to OSHA, “Most outdoor fatalities, 50- 70% occur in the first few days of working in warm or hot environments, because the body needs to build a tolerance to the heat, gradually over time.” This process is called [heat acclimatization](#), and the lack of acclimatization represents a major risk factor for fatal outcomes.

Occupational risk factors for heat illness include heavy physical activity; warm or hot environmental conditions; lack of acclimatization; and wearing clothing that holds in body heat.

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- Compliance safety and health officers (CSHOs), who are investigating for other purposes, shall open or refer a heat-related inspection for any hazardous heat conditions observed, or where an employee brings a heat-related hazard(s) to the attention of the CSHO (such as, employees or temporary workers being exposed to high-temperature conditions without adequate training, acclimatization, or access to water, rest and shade).
- When the weather is hot or a heat alert is issued for an area where the WHD, (Wage and Hour Division) is investigating, the WHD is encouraged to coordinate with OSHA by providing information on heat-related hazards.
- CSHOs should inquire during inspections regarding the existence of any heat-related hazard prevention programs on heat priority days. A heat priority day follows when the heat index for the day is anticipated to be 80°F or more.
- Programmed inspections could occur on any day that the NWS (National Weather Service) has announced a heat warning or advisory for the local area. **IHW**

Hazardous heat exposure can occur indoors or outdoors—and during any season, if the conditions are right—not only during heat waves.

Some outdoor industries where workers have suffered heat-related illnesses include:

- Agriculture
- Construction—road, roofing and other outdoor work
- Landscaping
- Mail and package delivery
- Oil and gas well operation

Some indoor industries where workers have suffered heat-related illnesses include:

- Bakeries, kitchens and laundries (businesses with heat-generating appliances)
- Electrical utilities (boiler rooms)
- Fire service
- Iron/steel mills and foundries
- Manufacturing with hot local heat sources, like furnaces (i.e., paper products and concrete)
- Warehousing

**WHAT TO KNOW:**  
**Compliance Requirements**

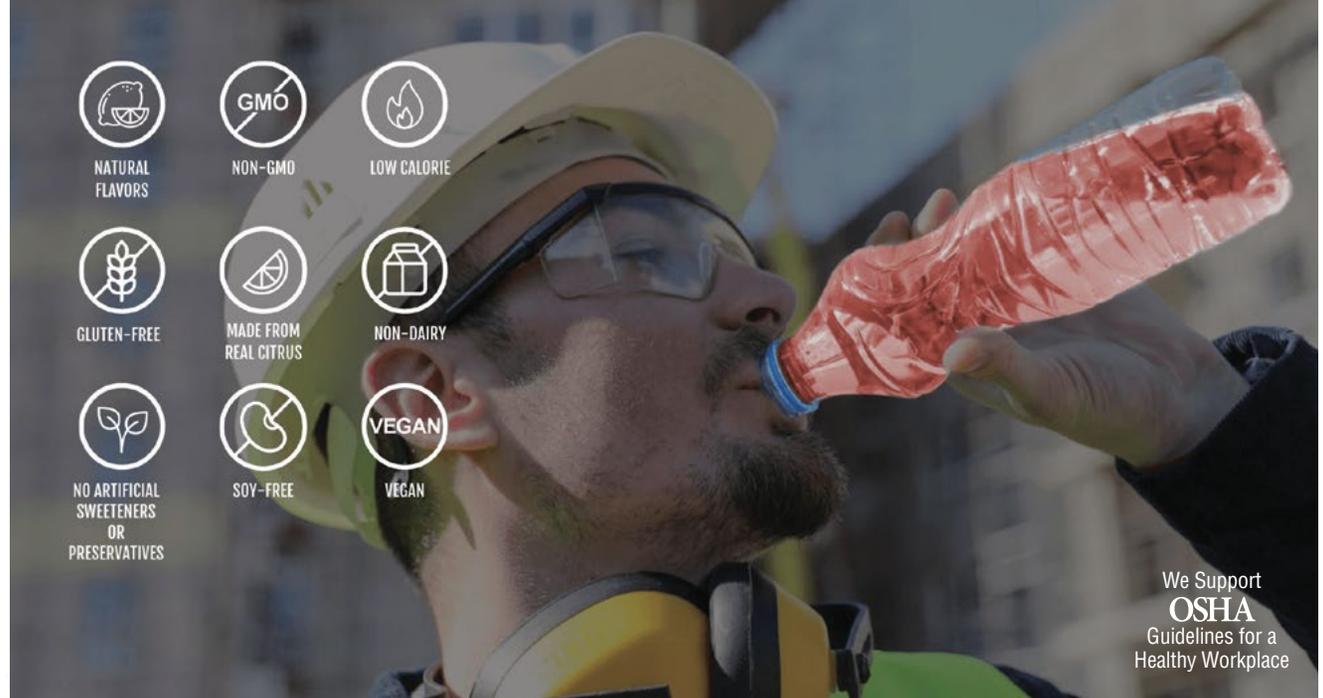
All industries that could potentially deal with heat-related illnesses and conditions should note the following:

**Resources:**

- For more information about how to properly access high temperatures in correlation with safe working practices, visit: <https://www.osha.gov/heat-exposure/hazards>
- For Employers Adminstrating Heat Illness Prevention Training, read: [https://www.osha.gov/sites/default/files/osa\\_heattraining\\_guide\\_0411.pdf](https://www.osha.gov/sites/default/files/osa_heattraining_guide_0411.pdf)
- For Specifics on planning and supervision, visit: <https://www.osha.gov/heat-exposure/planning>
- To read up on more case studies, visit: <https://www.osha.gov/heat-exposure/case-studies>
- For general heat exposure guidelines, visit: <https://www.osha.gov/heat-exposure>

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## Preventing Fire & Dust Explosions: NFPA 654

“NFPA 654 is a great place to start when taking steps to identify hazards and developing action items designed to reduce risk within a facility handling explosible or combustible materials. There are NFPA codes specific to an industry, but NFPA 654 covers all other processes where combustible material is present.” *Fauske & Associates, 1-877-328-7531, <https://www.fauske.com/chemical-industrial/testing/combustible-dust>*

### Background & History

NFPA 654, the “Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,” is an all-encompassing standard on how to design a safe dust collection system. This standard also points people to more direct standards that deal with different types of dust and explosion protection equipment.

In the U.S., OSHA and the National Fire Protection Association (NFPA) regulate combustible dust issues, each with its own area of responsibility. OSHA, together with local authorities, enforces the NFPA’s combustible standards. OSHA’s Combustible Dust National Emphasis Program (NEP) outlines policies and procedures for inspecting workplaces that create or handle combustible dusts that have the potential to cause a deflagration, fire or explosion.

The Standards Council of the National Fire Protection Association (NFPA), Quincy, Mass., issued the 2013 revision of the NFPA 654 “Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids.” This standard applies to all combustible particulate solids or hybrid mixtures, regardless of concentration or particle size, where the materials present a fire or explosion hazard. The owners or operators of affected facilities are responsible for implementing the requirements.

Some of the changes in the past 15 years include administrative controls, such as safety-management practices; added

training requirements for contractors and subcontractors; and incident investigation and reporting requirements. Important sections regarding housekeeping programs and hierarchy of clean-up operations also are included in the 2014 revision. Incident history and statistics clearly indicate that secondary dust explosions—caused by inadequate housekeeping and excessive dust accumulations—have caused much of the damage and casualties experienced in major industrial dust explosions.

### Importance of Standard

Dust explosions are an ever-present risk faced by process plants that handle combustible powders or other bulk solids. To minimize this risk and provide plant officials with practical requirements to protect against dust explosions, NFPA, in August 2005, first revised NFPA 654 to include Best Engineering Practice designed to protect facilities from combustible dust explosions.

Combustible dust is any finely divided solid—such as flour, wood dust or coal dust—that will burn when dispersed in air and ignited. The standard identifies measures to be taken to avoid dust explosions by designing facilities and work practices that prevent the production and spreading of dust, as well as controlling ignition sources, and provides mitigation recommendations for explosions that cannot be prevented.

NFPA standards are typically adopted by state fire marshals, insurance companies and consultants. The standard applies to “all phases of the manufacturing, processing, blending, pneumatic conveying, repackaging and handling of combustible particulate solids or hybrid mixtures, regardless of

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concentration or particle size, where the materials present a fire or explosion hazard.” (paragraph 1.1.1)

### WHAT TO KNOW: Compliance Requirements

The standard contains comprehensive guidance on the control of dusts to prevent explosions. The following are some of its recommendations:

- Minimize the escape of dust from process equipment or ventilation systems
- Use dust collection systems and filters
- Utilize surfaces that minimize dust accumulation and facilitate cleaning
- Provide access to all hidden areas to permit inspection
- Inspect for dust residues in open and hidden areas, at regular intervals
- Clean dust residues at regular intervals
- Use cleaning methods that do not generate dust clouds, if ignition sources are present
- Only use vacuum cleaners approved for dust collection
- Locate relief valves away from dust hazard areas
- Develop and implement a hazardous dust inspection, testing, housekeeping & control program (preferably in writing, with established frequency & methods)

When all of the recommendations of NFPA 654 are met and the potential for dust explosions is still present, an explosion-prevention system should be implemented where needed. **IHW**

### Resources:

→ To purchase the standard, go to the NFPA catalog online store: <https://tinyurl.com/h4eb48n5>



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# Prevention and Mitigation of Combustible Dust and Severe Accidents

- Dust Hazards Analysis (DHA)
- Combustible Dust Testing
- NFPA 652 DHA Training
- OSHA Compliance

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# Occupational Noise Exposure: OSHA's 1926.52

“OHD is honored to develop and supply technologies that help organizations protect their employees and maintain compliance. We participate in and appreciate the efforts to advance regulation, while promoting economic growth.”  
*Stephanie Lynch, Senior Research and Technology Manager at OHD*

## Background & History

OSHA estimates approximately 22 million workers are exposed to potentially damaging occupational noise every year. Not only does hearing loss have a distressing quality-of-life impact for those workers and their families, but U.S. businesses annually pay upwards of \$1.5 million in penalties for not protecting workers from noise.

The U.S.'s OSHA Noise Exposure Regulation became effective in 1971. Since 1983, that regulation has included an

amendment to require specific components related to hearing protection, audiometric testing and training.

OSHA's 1926.52 consists of parts "a" through "d." Each subpart addresses a different aspect of occupational noise exposure.

**1926.52(a)**—"Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown

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in Table D-2 (*see chart*) when measured on the A-scale of a standard sound level meter at slow response."

**1926.52(b)**—"When employees are subjected to sound levels exceeding those listed in Table D-2, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the table, PPE, as required in subpart E, shall be provided and used to reduce sound levels within the levels of the table."

**1926.52(c)**—"If the variations in noise level involve maxima at intervals of one second or less, it is to be considered continuous."

**1926.52(d)(1)**—"In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered."

**1926.53 (d)(2)** consists of the following chart:

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115



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The standard states, in subpart (d)(2), “When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each.”

### Importance of Standard

Noise is one of the most pervasive occupational health problems and is often present in many industrial and construction processes. Workers can suffer permanent hearing loss when exposed to high levels of noise for prolonged periods. Moreover, repeated exposures to loud noise, even for short periods, can also result in permanent hearing damage. Once permanent noise-induced hearing loss occurs, it cannot be reversed; there is no “cure.” And, because hearing loss usually occurs gradually, workers might not even realize it’s happening—until it’s too late.

Because it can be a painless, gradual progression, occupational noise is often referred to as a “stealth long-term hazard.” Noise-induced hearing loss can be reduced or eliminated through the successful application of engineering controls and hearing conservation programs. If those controls are feasible, employers must implement an effective hearing conservation program.

### WHAT TO KNOW: Compliance Requirements

The standard is stated per OSHA, above, but what does that mean in layman’s terms? OSHA explains that the following can be an indication that noise may be an issue in the workplace if employees:

- Hear ringing or humming in their ears when they leave work.
- Have to shout to be heard by a coworker an arm’s length away.
- Experience temporary hearing loss after leaving work.

According to OSHA, employers can protect their workers from excessive noise and prevent hearing damage by using “quieter machines, isolating the noise source, limiting worker exposure or using use effective protective equipment” that can modulate noise below certain thresholds.

Employers and workers can also use a tool to combat workplace exposure to excessive noise; NIOSH’s Sound Level Meter App measures workplace sound levels (see “Resources” section, below). The app can help reduce occupational noise-related hearing loss by providing guidance to allow stakeholders to make informed decisions about exposures. **IHW**

### Resources:

- To read the entire standard, visit <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.52>
- NIOSH’s Sound Level Meter App: <https://www.cdc.gov/niosh/topics/noise/app.html>
- OSHA also has numerous blogs and articles that directly address occupational noise exposure in different work situations/settings:
  - 1926.52 - [Effective hearing conservation program elements for the Construction Industry.](#)
  - 1926.52 - [OSHA’s regulations apply only to employer-employee relationship and not to employer activities that can affect the general public.](#)
  - 1926.52 - [The hearing conservation amendment does not cover construction or agriculture.](#)
  - 1926.52 - [Use of Music Headphones on Construction Sites](#)
  - 1926.52 - [Welding and Noise in confined space](#)



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## Respirator Fit-Testing Methods (ANSI/AIHA/ASSE Z88.10-2010)

“A proper respirator fit test is a critical component of workers’ respiratory protection. Quantitative fit testing (QNFT) is the most accurate method—using data to calculate the fit factor. TSI’s PortaCount™ Respirator Fit Tester provides step-by-step guidance that measures the proper fit of the respirator using our Fit Pro™ Ultra software, which can also support qualitative (QLFT) test methods.” *Jason Rutz, Global Product Manager, TSI, [jason.rutz@tsi.com](mailto:jason.rutz@tsi.com), 800-680-1220, [tsi.com](http://tsi.com)*

### Background & History

Developed by ANSI (now known as ASSP), with content provided by the American Society of Safety Engineers (ASSE), guideline Z88.10-2010 provides respiratory protection program managers (RPPM) with clear, consistent guidance on respirator fit-testing and the components required of an effective respiratory protection program. Included in the guide are instructions on how to avoid interference of PPE; it also provides detailed information on face pieces, including their selection, and other considerations for effective fit-testing. Z88.10 was last updated in 2010.

Qualitative fit-testing is a pass/fail test that uses the wearer’s sense of taste or smell, or his reaction to an irritant, in order to detect leakage into the respirator facepiece. Whether or not a worker needs a full-face respirator or a half-mask respirator

depends on the Assigned Protection Factor (APF). The APF is a number that describes the level of protection that a respirator can be expected to provide—if used properly.

Yearly fit-testing is now required. According to OSHA, an employer that performed fit-testing every two years reported 7% of their employees switched to different respirator sizes and/or models each time they were tested. OSHA considered this 7% measurement to be unacceptable and adopted the policy to require annual fit-testing and training.

### Importance of Standard

Fit-testing is a protocol used to evaluate sealing surface leakage of a specific, tight-fitting respirator while it is being worn. Individuals do not have to be issued the same respirator that they are fit-tested with, as long as they are issued a respirator that is the same make, model, style, size and material of respirator with which they are fit-tested. There are two categories of respirator fit-testing, which include qualitative and quantitative fit-testing methods.

Standard Z88.10 provides in-depth requirements for training fit-test operators; it also includes a large section entitled “General Considerations,” which covers in detail the important considerations for performing all respirator fit-testing protocols.

Clause 6 of the General Considerations section includes medical evaluation and pre-fit test training (such as how to don the respirator without assistance). Z88.10 recommends using a mirror to see how to position and adjust the respirator, for example. Also in this section are guidelines on how to inspect the respirator and how to accomplish user seal checks.



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### WHAT TO KNOW: Compliance Requirements

There are numerous factors that could potentially diminish the effectiveness and fit of a respirator. These include:

- Weight gain or loss
- Dental work or facial surgery
- Significant scarring in areas where seal meets skin
- Wearer discomfort
- Facial hair or certain hair styles
- Cosmetics or facial jewelry
- Glasses or protective eyewear
- Do not perform fit-testing if any foreign material, like gels or creams, are present between the sealing surfaces of the face and the respirator
- PPE must not interfere with respirator sealing surfaces and must be worn during fit-testing

In addition, there are some other conditions that can adversely affect fit. These include possible facial feature interference, such as hollow temples, exceedingly protruding cheekbones, deep skin creases, absence of teeth or dentures, or facial injury including mouth or facial swelling.

If dentures are worn during respirator use, dentures should be worn during fit-testing. If dentures are not worn during respirator use, then dentures should not be worn during fit-testing. **IHW**

### Resources:

→ Copies of the standard can be purchased online, at the ANSI Webstore: <https://bit.ly/2PKVCqb>



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# OSHA 1915.84: Safeguard Your Lone Workers

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“A lot can happen between check-in times; employers who satisfy OSHA 1915.51 with a “time-based check-in” system often tell us that check-in systems do not work and find a Grace Lone Worker “immediate notification” system to be more effective. Grace Lone Worker Pendants are relied upon to automatically transmit a distress alarm when an employee is incapacitated and unable summon assistance on their own. And, it removes the wait between expected check-in times.”  
*Grace Industries, [www.graceloneworker.com](http://www.graceloneworker.com), 724-962-9231*

## Background & History

“OSHA 1915.84: Working Alone” is a regulation that requires employers to account for each employee working alone, throughout each work shift, at regular intervals appropriate to the job assignment, to ensure the employee’s safety and health. This regulation applies to employees working alone in confined spaces or isolated locations.

OSHA defines a lone worker as “an employee working alone, such as in a confined space or isolated location.” Under OSHA’s 1915.84, whenever a worker is doing their job alone, “such as in a confined space or isolated location, the employer shall account for each employee” regularly throughout their shift via some form of communication.

All employers have an inherent duty to protect all workers—including those who work remotely or are isolated. Being a lone worker doesn’t just mean being on a distant worksite, a confined space or not being within other employees’ earshot, however. It can also include remote office work, traveling alone or being on a night shift by oneself. It can mean working without being under direct supervision (i.e., not necessarily “working alone”); it can also include a worker who will be in isolation for any given time period.

## Importance of Standard

More people work alone than ever before. [Berg Insight](#) reports there are 53 million lone workers in the U.S., Canada and Europe combined, which is about 15% of the overall workforce.

The International Data Corporation (IDC) estimates that approximately 1.3 billion people worldwide are mobile workers, many of whom work alone continuously or at various times during their workday.

People working in field operations who work alone face different risks than those who work with a team. It’s essential to recognize what those risks are and to implement control measures to mitigate those risks. The goal of any lone worker program is to prevent workers from going undetected if they become incapacitated or trapped in the field and are unable to summon help.

Anticipating lone worker risks is therefore imperative for employers. Controlling the unique hazards workers face can help mitigate risk and prevent serious injury.

## Specific Type of Lone Worker: Confined Spaces

OSHA defines a confined space as a work area large enough for the worker to enter and perform tasks, but one that it is not designed for people. Specifically, says OSHA, a confined space “also has limited or restricted means for entry or exit and is not designed for continuous occupancy.”

People who work in confined spaces come from a wide range of industries. According to the U.S. Bureau of Labor Statistics, from 2011-2018, the top five occupations with the most confined spaces-related deaths were:

- Construction laborers
- Farmers, ranchers and other agricultural employees
- First-line supervisors of construction trades and extraction workers
- Plumbers, pipefitters and steamfitters





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- Farmworkers and laborers for crops, nurseries and greenhouses

The deadly incidents ranged from falling, trench collapses, harmful substance inhalation, as well as fire and explosions.

### WHAT TO KNOW: Compliance Requirements

The standard reads as follows:

*“(a) Except as provided in § 1915.51(c)(3) of this part, whenever an employee is working alone, such as in a confined space or*

*isolated location, the employer shall account for each employee:*

*(1) Throughout each work shift at regular intervals appropriate to the job assignment to ensure the employee’s safety and health; and  
(2) At the end of the job assignment or at the end of the work shift, whichever occurs first.*

*(b) The employer shall account for each employee by sight or verbal communication.”*

### Risk Assessment

An important step to determining whether employees are safe to work alone is carrying out a risk assessment for each employee/environment. If the risks identified are too high or not able to be controlled, an employer should not allow employees to work alone under any circumstance. However, if steps can be taken to reduce risks, in line with leg-

islation, employees can work alone. This is where a good lone worker policy becomes essential.

### Lone Worker Policies

A lone worker policy is a guide that sets out a company’s rules on working alone; it can also assist employees in understanding the risks of working alone or remotely. A good lone worker policy also provides workers with instruction and advice on how to safely do their jobs. Further, it is a good idea to conduct inspections to ensure that safe lone worker practices are being implemented and followed properly. **IHW**

### Resources:

- OSHA website: <https://www.osha.gov/laws-regs/regulations/standardnumber/1915/1915.84>
- *Industrial Hygiene in the Workplace* has covered many aspects of lone and remote worker safety throughout the past few years. Here is a small sampling:
  - “OSHA’s General Duty Clause & Lone Worker Safety:” <https://bit.ly/3NyGOHu>
  - “The Biggest Safety Hazard Threatening Lone Workers:” <https://bit.ly/43u26w1>
  - “Keeping Lone Workers Safe:” <https://bit.ly/44y3w9r>
  - “Four Problems Lone Workers Face and How to Solve Them:” <https://bit.ly/3rfGYfx>

# How Do You Protect Your Lone Workers?

## Employee Check-In Systems Don't Work! You Need an Immediate Notification System

- How Long Would You Expect to Wait for Help?
- A Lot Can Happen Between Employee "Check-Ins"
- Real-Time Immediate Notification of a Man-Down
- No Monthly Fees or Annual Subscriptions
- Don't Rely on Cellular Service or Cell Phone Apps
- Don't Rely on the Internet or Website Monitoring
- Rugged and Intrinsically Safe for Harsh Environments
- Interface with SCADA and All Other Alarm Systems





# Heat Stress Guide for Employers

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“Heat related illnesses are preventable with the right tools and controls. At TSI®, our QUESTemp® Heat Stress Monitors are designed to quickly and accurately evaluate potential heat stress environments. These instruments deliver high-performance monitoring using Wet Bulb Globe Temperature (WBGT) sensing technology and the calculation of a WBGT Index value, the standard for heat stress management.” *Jason Rutz, Global Product Manager, TSI, [Jason.Rutz@tsi.com](mailto:Jason.Rutz@tsi.com), 800-680-1220, [TSI.com](http://TSI.com)*

## Background & History

OSHA does not have a specific standard that covers working in hot environments. Nonetheless, under the OSH Act, employers have a duty to protect workers from recognized serious hazards in the workplace, including heat-related hazards. *The Heat Index: A Guide for Employers* was created to help employers and worksite supervisors prepare and implement hot weather plans. This guide explains how to use the heat index to determine when extra precautions are needed at a worksite, with the goal to protect workers from environmental contributions to heat-related illness.



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## Importance of Standard

Outdoor workers exposed to hot and humid conditions can be at risk of heat-related illness. The risk of heat-related illness becomes greater as the weather gets hotter and more humid. The combination of both air temperature and humidity affect how hot outdoor workers feel in hot-weather conditions.

Employers need to take into consideration the “heat index,” which is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels. The heat index is considered a better measure than air temperature alone for estimating the risk to workers from environmental heat sources.

- NOAA issues extreme-heat advisories to indicate when excessive, extended heat will occur. The advisories are based mainly on predicted heat index values:
- Excessive Heat Outlook: issued when the potential exists for extended excessive heat (heat index of 105-110°F) over the next 3-7 days. This is a good time to check on supplies, such as extra water coolers, and refresh worker training.
- Excessive Heat Watch: issued when excessive heat could occur within the next 24-72 hours, but the timing is uncertain.
- Excessive Heat Warning: issued when the heat index will be high enough to be life-threatening in the next 24 hours. This warning indicates that the excessive heat is imminent or has a very high probability of occurring.
- Excessive Heat Advisory: similar to an Excessive Heat Warning, but less serious. This is issued when the heat index could be uncomfortable or inconvenient but is not life-threatening if precautions are taken.

## WHAT TO KNOW: Compliance Requirements

Extra measures, including implementing precautions at the appropriate risk level, are necessary for reducing the risk of heat stress for employees working outdoors in extreme heat. The employer’s response at the four risk levels is the subject of the remainder of OSHA’s guidelines. The steps employers should take in response to an elevated heat index are the same type of steps that they would follow to address other hazards in the workplace:

- Develop an illness-prevention plan for outdoor work based on the heat index.
- Train your workers how to recognize and prevent heat-related illness. Train workers about safe work practices before heat index levels go up. Workers should be prepared, so they recognize the signs and symptoms of heat-related illness; how to prevent it; and what to do if someone is demonstrating symptoms.
- Track the worksite heat index daily; communicate it and the required precautions to workers. Knowing how hot it will be during scheduled work activities can help to determine which preventive measures should be taken in preparation.
- Implement your plan; review and revise it throughout the summer.

It is suggested that workers are trained before hot outdoor work begins, and training can be more effective if it is matched to job tasks and conditions and is reviewed and reinforced throughout hot weather conditions. The following OSHA-suggested training topics might be addressed in one session or in a series of shorter sessions:

- Risk factors for heat-related illness

- Different types of heat-related illness, including how to recognize common signs and symptoms
- Heat-related illness prevention procedures
- Importance of drinking small quantities of water often
- Importance of acclimatization; how it is developed; and how your worksite procedures address it
- Importance of immediately reporting signs or symptoms of heat-related illness to the supervisor
- Procedures for responding to possible heat-related illness
- Procedures to follow when contacting emergency medical services
- Procedures to ensure that clear and precise directions to the worksite will be provided to emergency medical services **IHW**

### Resources:

- You can find more about information about heat stress at *Using the Heat Index: A Guide for Employers* <https://bit.ly/34v0nYJ> or, for training documents, you can visit <https://bit.ly/2M6Eto9>.

## OSHA's Critical Actions for Heat Risk

According to OSHA\*, the most critical actions employers should take to help prevent heat-related illness at each risk level:

**Heat Index:** <91°F

**Risk Level:** Lower-Caution

**Suggested Measures:**

- Provide drinking water
- Ensure that adequate medical services are available
- Plan ahead for times when heat index is higher, including worker heat-safety training
- Encourage workers to wear sunscreen
- Acclimatize workers

If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.

**Heat Index:** 91°-103°F

**Risk Level:** Moderate

**Suggested Measures:**

In addition to the steps listed above:

- Remind workers to drink water often (about four cups/hour)
- Review heat-related illness topics with workers: how to recognize heat-related illness; how to prevent it; and what to do if someone gets sick
- Schedule frequent breaks in a cool, shaded area
- Acclimatize workers
- Set up buddy system/instruct supervisors to watch workers for signs of heat-related illness

If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.

- Schedule activities at a time when the heat index is lower
- Develop work/rest schedules

**Monitor workers closely**

\*This chart is available online at [http://www.osha.gov/SLTC/heatillness/heat\\_index/](http://www.osha.gov/SLTC/heatillness/heat_index/).

**Heat Index:** 103°-115°F

**Risk Level:** High

**Suggested Measures:**

In addition to the steps listed above:

- Alert workers of high-risk conditions
- Actively encourage workers to drink plenty of water (about four cups/hour)
- Limit physical exertion (e.g., use mechanical lifts)
- Have a knowledgeable person at the worksite who is well-informed about heat-related illness and able to determine appropriate work/rest schedules
- Establish and enforce work/rest schedules
- Adjust work activities (e.g., reschedule work, pace/rotate jobs)
- Use cooling techniques
- Watch/communicate with workers at all times

**When possible, reschedule activities to a time when heat index is lower**

**Heat Index:** >115°F

**Risk Level:** Very High-Extreme

**Suggested Measures:**

Reschedule non-essential activity for days with a reduced heat index or to a time when the heat index is lower

Move essential work tasks to the coolest part of the work shift; consider earlier start times, split shifts, or evening and night shifts.

Strenuous work tasks and those requiring the use of heavy or non-breathable clothing or impermeable chemical protective clothing should not be conducted when the heat index is at or above 115°F.

If essential work must be done, in addition to the steps listed above:

- Alert workers of extreme heat hazards
- Establish water drinking schedule (about four cups/hour)
- Develop and enforce protective work/rest schedules
- Conduct physiological monitoring (e.g., pulse, temperature, etc.)

**Stop work if essential control methods are inadequate or unavailable.**



# Data Doesn't Wait for Symptoms

Protect your workers before  
heat stress illness related  
symptoms arise

When it comes to worker exposure to heat, don't wait  
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From heat-stress monitors, noise dosimeters, sound level meters,  
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complete line of solutions to support your work. All with the local  
service and support from the name you've come to trust – TSI®.



# Tackling Combustible Dust Hazards

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“Proper housekeeping is a powerful and essential line of defense against many types of workplace hazards, and combustible dust is no exception. NFPA 652 recommends cleaning methods, such as vacuuming, but also outlines specific design requirements to ensure the equipment can meet the demands of collecting combustible dust. In the absence of a formal OSHA rule, NFPA 652 is vital to guiding our manufacturing customers on how to identify, measure and, most importantly, choose the proper industrial vacuum to safely mitigate their combustible dust risk.” *Nilfisk*, 800-989-2235, [www.nilfisk.us](http://www.nilfisk.us)

## Background & History

NFPA 652: Standard on the Fundamentals of Combustible Dust, 2016 edition, became effective Sept. 2015. This standard was created to promote and define hazard analysis, awareness, management and mitigation. The standard also issues a new term, Dust Hazard Analysis (DHA), to differentiate this analysis from the more complex forms of process hazard analysis methods currently found in industry. NFPA 652 is the starting point for this analysis. It will guide you, step by step, in identifying hazards and what to do next. If a company has processes that create dust or use powders, then it has a responsibility to determine if a combustible dust hazard exists.

The NFPA standards have required a process hazard analysis since 2005. NFPA 652 takes this requirement further by making this requirement retroactive to existing installations, with a deadline. A DHA is now required for new installations and upgrades to existing installations. The standard allows

three years to complete this DHA. To illustrate the importance of this hazard analysis, many OSHA citations regarding combustible dust hazards list the lack of a hazard analysis at the top of the citation.

## What is Combustible Dust?

Combustible dusts are created during the transportation, handling, processing, polishing and grinding of the materials. Abrasive blasting, crushing, cutting and screening dry materials can also create dust.

Combustible dust is any fine material that can catch fire and explode when mixed with air. OSHA defines combustible dust as “...a solid material composed of distinct particles or pieces, regardless of size, shape or chemical composition, which presents a fire or deflagration hazard when suspended in air or some other oxidizing medium over a range of concentrations.”

This does not always mean the types of material normally considered either combustible or dangerous. It can include metal dust, wood dust, plastic or rubber dust, coal dust, biosolids, dust from certain textiles—even organic dust, like flour, sugar, paper, soap and dried blood.

## WHAT TO KNOW: Compliance Requirements

The purpose of a dust-collection system is to remove and isolate dust away from people who can inhale it and process areas where it could accumulate and become a deflagration hazard. The DHA will identify the following conditions that may exist external or internal to the system that contribute to a fire or deflagration hazard:

- **Presence of oxygen:** Air is the oxidant
- **Presence of fuel:** Combustible dust wherever it is found, including floors, elevated surfaces, inside ducts, and inside process enclosures and machines

## ADDRESSING DUST CHALLENGES FOR FOOD PACKAGING

Dust can often be created during packaging, as finished products are moved by conveyor or during the box- or bag-filling process. The “puffs” of compressed air used during the bag-filling process can generate little puffs of dust while filling packages. This can cause an accumulation of dust over time, if not addressed properly, which can also create several challenges during the packaging process, including:

- **Cross-contamination:** Packaging lines for multiple products are often located in the same facility, creating a cross-contamination concern if fugitive dust is allowed to escape.
- **Nuisance dust/aesthetics:** Dust that settles on or in packaging is unappealing to consumers of packaged food products.
- **Microbial growth:** Dust that is allowed to settle on surfaces in the packaging facility or in between packaging layers provides a medium for microbial growth.
- **Combustion risk:** Food processing dusts—including flours, powdered milk, corn starch, wheat starch, sugar, tapioca, whey, cocoa powder and many spices—are highly combustible.

To address the challenges, food packaging operations must look at the whole process, including needs analysis, system design and engineering, collector and ductwork installation, filter selection, HVAC system integration, startup and commissioning, and aftercare and service. Calling the experts to help ensure your operations remains NFPA 652-compliant.  
—*Packaging Technology Today*

- **Dispersion of fuel:** includes pulse cleaning inside dust collector; use of compressed air for cleaning; and events that can dislodge dust from elevated surfaces
- **Ignition sources:** Sparks, electrical shorts, hot work, electrostatic discharge, flames, rotating equipment, hot surfaces
- **Containment locations:** inside pipes; inside dust collectors; and inside any process enclosure or machine. **IHW**



#### Resources:

Because so many different types of workplaces might contain potential combustible dust risks, it's essential to conduct a thorough risk assessment. Failing to comply with this standard can leave you open to serious fines and even more serious injuries, if an incident occurs.

- OSHA offers a lengthy list of materials that could produce combustible dust: <https://bit.ly/1Lni5C7>
- Become familiar with NFPA 652: Standard on the Fundamentals of Combustible Dust. <https://bit.ly/2KD03Po>. It provides basic principles and requirements for identifying and managing fire and explosion hazards from combustible dust.

- OSHA looks to this standard for guidance when it comes to best practices for preventing combustible dust fires and explosions. Those who don't take the necessary steps to protect workers can be fined for violations under 18 different standards as part of OSHA's Combustible Dust National Emphasis Program. <https://bit.ly/2Rd1Eh8>. This includes the General Duty Clause and 29 CFR 1910.22, the main housekeeping standard.
- For more an in-depth discussion of combustible dust, see the article titled "How to Prevent Combustible Dust Incidents in the Workplace" in *WMHS's* November 2018 issue: <https://bit.ly/2zsbRPM>

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# Crystalline Silica General Industry and Maritime Standard

“HafcoVac’s pneumatic-certified combustible dust vacuums, along with specially designed accessories, help prevent health hazards associated with silica dust. The use of our Essential Overhead Tool Kit, in combination with the powerful suction and HEPA filtration of our certified vacuums, protects against silica inhalation by vacuuming them before the particles are disturbed in the workplace. Coupled with same-day shipping and a lifetime warranty, it’s THE safe, simple solution you are looking for.” *HafcoVac, 877-820-0050, [www.hafcovac.com](http://www.hafcovac.com)*

## History

Dust control efforts can include HEPA-filtered vacuuming; wet methods that apply water at the point where silica dust is made; local exhaust ventilation that removes silica dust at or near the point where it is made; and enclosures that isolate the work process or the worker.

Workers must not allow dry sweeping or dry brushing where they could contribute to employee exposure to respirable crystalline silica, unless methods like the ones mentioned above are not feasible. In addition, employers must not allow compressed air to be used to clean clothing or surfaces unless (1) the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or (2) no alternative method is feasible.

## Why Standard Matters

Crystalline silica is all around us: in sand, stone, concrete and mortar. This common mineral found in the earth’s crust is also used to make products such as glass, pottery, ceramics, bricks and artificial stone.

However, when it’s turned into tiny particles by workplace activities like cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick and mortar, crystalline silica

becomes respirable—and dangerous to human health.

Approximately 2.3 million people in the U.S. are exposed to respirable crystalline silica at work. Exposure can occur during the manufacture of glass, pottery, ceramic, brick, concrete, asphalt roofing, jewelry, artificial stone, dental, porcelain or structural clay products; the use of industrial sand in operations such as foundry work and hydraulic fracturing; and the use of sand for abrasive blasting (e.g., maritime operations).

Breathing in very small crystalline silica particles can cause a number of life-altering and life-threatening diseases. Silicosis, which results in scar tissue forming on the lungs, is incurable and can be fatal. It typically occurs after 15–20 years of occupational exposure to respirable crystalline silica. Because silicosis affects the immune system, it increases the risk of lung infections, such as tuberculosis. Exposure to respirable crystalline silica increases the risk of developing lung cancer, in which abnormal cells grow uncontrollably into tumors, interfering with lung function and often metastasizing to other parts of the body. Chronic obstructive pulmonary disease (COPD) causes shortness of breath due to difficulty breathing air into the lungs. It is usually irreversible. Exposure to respirable crystalline

silica is also related to kidney failure, the development of autoimmune disorders and cardiovascular impairment.

## Key Compliance Requirements

1910.1053 requires employers to:

- Determine the amount of silica that workers are exposed to if it is, or may reasonably be expected to be, at or above the action level of 25 µg/m<sup>3</sup> (micrograms of silica per cubic meter of air), averaged over an 8-hour day.
- Protect workers from respirable crystalline silica exposures above the permissible exposure limit (PEL) of 50 µg/m<sup>3</sup>, averaged over an 8-hour day.
- Limit access to areas where workers could be exposed above the PEL.
- Use dust controls and safer work methods to protect workers from silica exposures above the PEL.
- Provide respirators to workers when dust controls and safer work methods cannot limit exposures to the PEL.
- Establish and implement a written exposure control plan that identifies tasks that involve exposure and methods used to protect workers.
- Restrict housekeeping practices that expose workers to silica, such as use of compressed air without a ventilation system to capture the dust

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- and dry sweeping, where effective, safe alternatives are available.
- Offer medical exams—including chest X-rays and lung function tests—every three years to workers exposed at or above the action level for 30 or more days per year.
  - Train workers on the health effects of silica exposure, workplace tasks that can expose them to silica and ways to limit exposure.
  - Keep records of workers’ silica exposure and medical exams. **IHW**

## Resources:

- Details of the standard’s requirements can be found at: <https://tinyurl.com/yxu49g8l> and FAQs about it at: [www.osha.gov/silica-crystalline/general-industry-info](http://www.osha.gov/silica-crystalline/general-industry-info).
- For specifics on the construction aspect of this standard, go to: <https://www.osha.gov/silica-crystalline/construction>
- See **IHW**’s article introducing the new standard: <https://industrialhygienepub.com/respiratory/employer-responsibilities-under-oshas-new-crystalline-silica-rules-2/>



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