Employee Safety

Heat Stress Prevention: Safety in Manufacturing and Industrial Environments

Roland Jones | Apr 01, 2021

Heat stress is a common (but sometimes ignored) safety hazard in manufacturing facilities. As the spring and summer months approach, here's how to identify heat stress and prevent this potentially deadly workplace threat.

When it comes to keeping workers safe, safety managers know that excessive heat can be deadly.

Millions of U.S. workers are exposed to heat in their working conditions, and although illness from heat exposure is preventable, thousands become sick from occupational heat exposure every year, ***the Occupational Safety and Health Administration notes***.

Some of those cases are fatal.

Extreme heat was the third-highest weather-related cause of death in 2019 with 63 fatalities, according to ***the latest statistical information*** from the National Weather Service.

> **Scientific research shows that even mild dehydration (the kind that's asymptomatic) profoundly affects productivity.**

The agency's data also show that, on average, extreme heat is the deadliest type of weather in the U.S., killing 138 people each year, according to the 30-year average from 1990 to 2019.

Occupational risk factors for heat illness include:

- Heavy physical activity
- Warm or hot environmental conditions
- Lack of acclimatization (most outdoor fatalities 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, OSHA notes)
- Wearing clothing that holds in body heat

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

Preventing Dehydration in the Workplace

Keeping your workers hydrated is crucial no matter the weather or time of year.

While the Occupational Safety and Health Administration (OSHA) does not provide a hydration standard, it does offer ***guidance on keeping workers safe*** when they are working in the heat.

To ensure your employees stay hydrated and safe, consider establishing a hydration program and putting some best practices in place.

A preliminary assessment of your workplace may include identifying hot or cold areas, the proximity of hydration stations to workers and whether water and electrolyte drinks can be placed on the plant floor.

Here are some other approaches to consider:

- Keep water and electrolyte products readily available, as both help workers remain hydrated. ***The Mayo Clinic*** recommends 15 8-ounce cups of fluids per day for men and 11 for women. OSHA guidance suggests a cup of water every 20 minutes when working or exposed to hot or extreme environments.
- Set up hydration stations in strategic locations and ensure they are equally accessible for all workers. If water supplies are not readily available near your workers, consider using ready-to-drink water bottles and pouches.
- Explain and promote self-monitoring. The easiest way for workers to monitor their hydration levels is through the color of their urine. You can learn more about urine color and hydration ***here***.
- Use hydration signage to encourage self-care. This may include posting urine color charts in employee restrooms or locker areas, using signage to detail recommended drink consumption or remind workers how often to take hydration breaks.
- Make good hydration part of your safety culture by including it in your routine training updates.

To combat heat stress, employers should make sure their workers are adequately hydrated and their facilities are sufficiently cooled and ventilated. Here are some tips to identify and prevent heat stress.

Read more: Winter Dehydration Facts: Causes, Symptoms and Prevention Tips

Keeping Workers Hydrated

Dehydration is no minor problem in industrial and manufacturing environments. It starts to happen before there are any glaringly obvious symptoms. What's more, workers often don't think they are becoming dehydrated if they aren't hot or sweating profusely. And they typically aren't thirsty.

The heavy personal protective equipment (PPE) required in industrial and manufacturing settings can

drive up body temperatures and induce sweating, as can working in a hot warehouse or production facility. PPE that increases body temperature includes arc flash suits, vests, helmets and gloves.

Dehydration is not solely an issue in the summer. It's a year-round concern that's just as likely to be brought on by cold stress as by extreme heat.

Scientific research shows that even mild dehydration (the kind that's asymptomatic) profoundly affects productivity. It can reduce a worker's reaction time, which can make the chance of an accident more likely—a dangerous prospect when working in a manufacturing environment or when doing any job that involves operating heavy machinery.

When you sweat, you lose minerals—the electrolytes that are found in your muscle cells: sodium, potassium, calcium and magnesium. These electrolytes ensure the proper muscle response so that people can operate at peak performance.

Indeed, elevated temperatures make us prone to error, according to *a report in Safety+Health magazine*, which cites a NASA study that concluded that when the temperature is 95 degrees for an extended period, people can make 60 mistakes per hour—without realizing it. This happens because blood moves to the skin to produce perspiration to cool the body, so other organs, including the brain, receive less blood than they normally need, interfering with cognitive thinking.

Read more: Common Causes of Dehydration—Fact vs. Fallacy

HVAC Cooling and Safe Ventilation

Cooling the air in industrial settings presents some challenges for companies as they seek to put the proper heat hazards and control measures in place and still avoid the potential spread of the COVID-19 virus.

The Centers for Disease Control and Prevention (CDC) *recently updated its guidance* on how employers and building managers can ensure proper ventilation in indoor workplaces amid the COVID-19 pandemic.

These measures include steps to increase ventilation safely and keep HVAC systems properly maintained. Steps to consider include:

- Opening outdoor air dampers beyond minimum settings to reduce or eliminate HVAC air recirculation
- Using a window fan, placed safely and securely in a window, to exhaust room air to the outdoors and draw outdoor air into a facility without generating strong room air currents
- Increasing *air filtration* to the highest possible level without significantly reducing design airflow
- Using portable high-efficiency particulate air (HEPA) fan/filtration systems to enhance air cleaning (especially in higher-risk areas of a facility, such as those inhabited by people with a greater likelihood of having or getting COVID-19)
- Using ultraviolet germicidal irradiation as a supplemental treatment to inactivate the COVID-19 virus, especially if options for increasing room ventilation and filtration are limited

Read more: Air Filtration: What Are MERV Ratings, and How Do They Protect Your Workers?

Managers should make sure a facility is well ventilated and provide cooling stations for workers, *according to the CDC*.

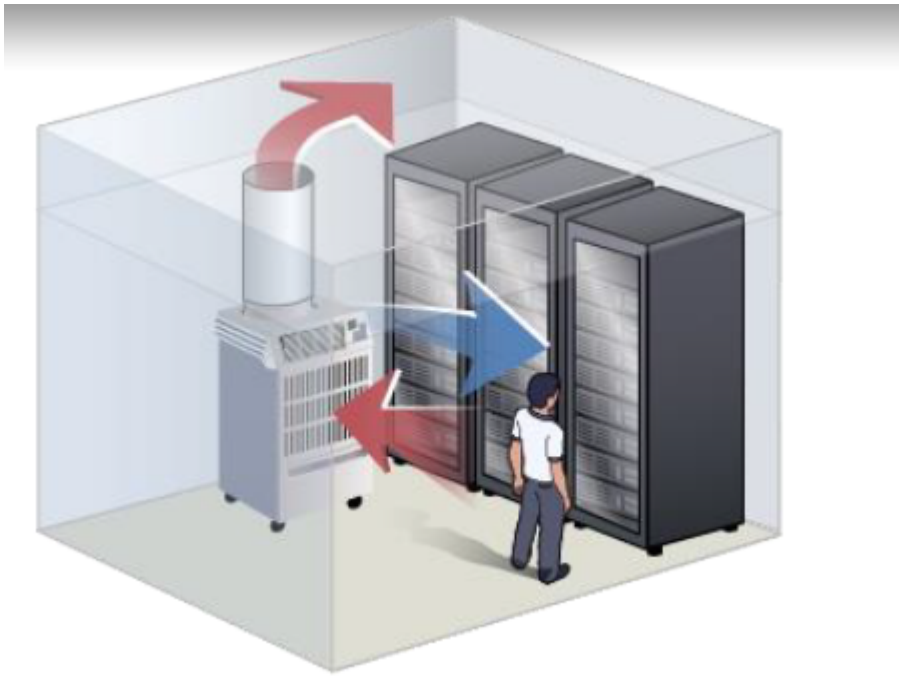
Increased air movement from fans makes workers feel cooler. And using fans in conjunction with HVAC air conditioning systems can make them more effective, too, as fans use a smaller amount of energy compared with an HVAC system and so cut your overall energy consumption. Portable A/C units can

help control heat in areas that become especially hot.

Avoiding Overheating Equipment

In addition to keeping employees safe and comfortably cool, manufacturers need to keep valuable equipment inside their facilities from overheating.

Overheated IT equipment can lead to reduced life and reliability, damage to hardware, a slower network and costly system downtime. Indeed, technology research company Gartner has estimated ***the average cost of network downtime is $5,600 per minute***.



Solutions may include using a portable air-conditioning unit that can be introduced to an overheated server room to reduce heat stress on equipment and people to keep critical operations up and running. It can supplement existing cooling systems or act as a standby in the event the main cooling system fails.

This solution is useful because portable air conditioners may be programmed to keep running after employees leave for the evening, providing targeted cooling and saving money on energy use.

Vanessa Jo Roberts contributed reporting to this article.

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Check out these additional HEAT STRESS Resources & Solutions.

How does your company keep its workers hydrated? Share your thoughts in the comments below.