



TEAMSTERS SAFETY & HEALTH FACTS

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Protecting Workers In Hot Environments

Exposure to excessive heat on the job, both indoors and outdoors, is a recognized hazard faced by many American workers. Occupational heat stress is the combination of metabolic heat¹, environmental factors (e.g., temperature, humidity), and the type of clothing worn. Many materials, especially impermeable materials used in personal protective equipment (PPE), can trap heat close to the skin and limit or prevent natural cooling such as through sweat evaporation. These factors together can lead to additional heat affecting the body, increasing core body temperature, and putting workers at risk for heat-related illnesses and injuries. These heat-related illnesses and injuries may lead to serious health conditions, disability, or death.

To understand the full impact of heat in the workplace, it is very important to document both its direct and indirect effects. Workers should not be blamed or disciplined for incidents where heat was a significant contributing factor.

This fact sheet discusses heat stress, how it can impact your health and safety at work, how heat-related illnesses can be prevented, and strategies your employer, as well as Teamster members and local unions, can use to address these hazards and minimize your risk of exposure.

What Causes Heat Stress?

Hazardous heat exposure can occur indoors or outdoors and can occur during any season if the conditions are right, not only during heat waves. Below are seven (7) risk factors which may lead to heat illness:

1. High temperature and humidity, direct sun exposure, no breeze or wind.
2. Heavy physical labor, indoors or outdoors.
3. Not drinking enough water, dehydrated.
4. Waterproof clothing or personal protective equipment (PPE) that are not breathable and prevent or slow the body's ability to lose excess heat.

¹ Metabolic heat is the heat your body creates naturally which can increase during exercise or physical exertion from work.



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5. Not being physically conditioned/adjusted (acclimated) to a hot workplace. *Acclimatization* is the natural process where the body adjusts to a change in its environment over a short period of time through steady and gradual exposure.
6. Personal characteristics such as age, physical fitness, degree of acclimatization, metabolism, dehydration, use of drugs, alcohol or certain medications, and a variety of medical conditions, such as hypertension, all affect a person's sensitivity to heat.

Approximately 50% to 70% of heat related fatalities in outdoor work environments occur in the first few days on the job. This number can be substantially reduced if workers are provided with the opportunity to build a tolerance gradually, a process called heat acclimatization. Lack of acclimatization represents a major risk factor for fatal outcomes.

What Disorders can be Caused by Repeated Exposure to High Heat Environments?

High heat exposure can aggravate existing health conditions such as asthma and heart disease and even increase a person's vulnerability to environmental toxins (e.g., chemicals/pesticides). Repetitive heat stress can also cause depressed kidney function and lead to chronic kidney disease.

The table below presents several heat related illnesses, their signs and symptoms:

Heat-Related Illness	Symptoms and Signs
Heat stroke	<ul style="list-style-type: none">• Confusion• Slurred speech• Unconsciousness• Seizures• Heavy sweating or hot, dry skin• Very high body temperature• Rapid heart rate
Heat exhaustion	<ul style="list-style-type: none">• Fatigue• Irritability• Thirst• Nausea or vomiting• Dizziness or lightheadedness• Heavy sweating• Elevated body temperature or fast heart rate



Heat cramps	<ul style="list-style-type: none">• Muscle spasms or pain• Usually in legs, arms, or trunk
Heat syncope	<ul style="list-style-type: none">• Fainting• Dizziness
Heat rash	<ul style="list-style-type: none">• Clusters of red bumps on skin• Often appears on neck, upper chest, and skin folds
Rhabdomyolysis (muscle breakdown)	<ul style="list-style-type: none">• Muscle pain• Dark urine or reduced urine output• Weakness

How Can Heat-related Illnesses be Prevented?

Most heat-related health problems can be prevented or reduced with your employers' commitment to conducting a risk assessment and providing the most protective hazard controls. Your employer should develop a written heat-related illness prevention program and designate a responsible person to oversee the program. Below are key elements of a heat-related illness prevention program:

Engineering Controls

A variety of engineering controls can reduce workers' risk of heat related injuries/illnesses:

- Cool or air-conditioned work environments or break areas
- General ventilation in indoor work environments
- Cooling fans
- Misting fans that produce a spray of fine water droplets
- Local exhaust ventilation designed and installed at points of high heat or moisture production (such as exhaust hoods in laundry rooms or steam presses) with guidance from a certified HVAC (Heating, Ventilation and Air Conditioning) professional
- Reflective shields to redirect radiant heat
- Mechanical equipment to reduce manual work (such as conveyors and forklifts)
- Insulation for hot surfaces (such as furnace walls).



Administrative or Work Practice Controls

Some worksites cannot be cooled by engineering controls or by those controls alone. In addition to engineering controls, employers should modify work practices (also known as 'administrative controls') when heat stress is too high to work safely:

- **Acclimatize** new or returning workers to build tolerance for working in the heat by scheduling shorter shifts, gradually increasing workloads, and taking more frequent breaks. Gradually increase shift length over the first 1-2 weeks. The employer should allow workers to interrupt their work if they exhibit and/or complain of known symptoms. Lack of acclimatization represents a major risk factor for fatal outcomes.
- **Reduce Physical Exertion** as much as possible by planning the work to minimize manual effort (such as using power tools or delivering material to the point of use so that manual labor is minimized).
- **Require Mandatory Rest Breaks** in a cooler environment (such as a shady location or an air-conditioned building). The duration of the rest breaks should increase as heat stress rises.
- **Provide Fluids** (water or electrolyte-containing fluids) at 50°-60°F and encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of liquids should be placed close to the work area.
- **Modify Work Schedules.** Reschedule all non-essential outdoor work for days with a reduced heat index. Schedule the more physically demanding work during the cooler times of day such as early morning or late afternoon. Rotate workers and split shifts, and/or add extra workers. Modify work schedules and activities for workers who are new to warm environments. Establish Work/Rest cycles using established industry guidelines. Stop work if essential control methods are inadequate or unavailable when the risk of heat illness is very high.
- **Provide recovery areas** such as air-conditioned enclosures and rooms and provide intermittent rest periods with water breaks.
- **Monitor for Heat Illness Symptoms.** Establish a system to monitor and report the signs and symptoms of heat illness to improve early detection and action. Workers should watch out for each other for symptoms of heat-related illness prepared to administer appropriate first aid to anyone who is developing a heat-related illness.
- **Emergency Planning and Response.** Emergency plan considerations include What to do when someone is showing signs of heat illness. How to contact emergency help. How long it will take for emergency help to arrive and training workers on appropriate first-aid measures until help arrives. Consider seeking advice from a healthcare professional in preparing a plan. Have people on the jobsite who are trained and equipped to provide lifesaving medical treatment e.g.,



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total body cooling, IV fluids, etc. Administer appropriate first aid to any worker who is developing a heat-related illness.

- **Training** supervisors and workers on all aspects of the heat-related illness prevention plan, including health effects of heat, the symptoms of heat illness, how and when to respond to symptoms, and how to prevent heat illness, and in a language and manner workers understand.

Personal Protective Equipment (PPE)

In most cases, heat-related illnesses should be reduced by engineering controls or work practice modifications. However, where heat stress levels exceed recommended limits, there are types of PPE that can be worn to protect against heat exposures both when actively engaged at work and at rest². These are called auxiliary cooling systems or personal cooling systems (e.g., water-cooled garments, air-cooled garments, cooling vests, and wetted overgarments) and can range in simplicity, cost, and maintenance.

Wearable personal cooling systems, however, have limitations such as:

- Ice vests are inexpensive, but their temperature cannot be controlled and they often do not stay cool long enough to be practical.
- If the cooling system is too cold, this will result in reduced heat transfer from the body to the environment.
- Water-cooled garments require that the worker be continuously connected to a system that circulates the cool water, which limits the person's range of operation.
- Many of the wearable personal cooling systems are too heavy or too cumbersome to be practical in a work environment.

Are There Any Federal and State Standards that Cover Heat-related Illnesses?

The federal Occupational Safety and Health (OSHA) Administration does not have a standard addressing the hazards of heat exposure. The federal OSHA office in Region 6 (covering private sector workers in Arkansas, Louisiana, Oklahoma, Texas and New Mexico) has a 'Regional Emphasis Program' (REP) that conducts inspections for outdoor heat-related health hazards when the high temperature is forecast to be above 80°F.³ Pressure from worker advocate groups, environmental organizations, and unions, including the IBT, has resulted in Congressional legislation, the '*Asunción Valdivia Heat Illness and Fatality Prevention Act*,' that if passed would require OSHA to create a new enforceable standard to protect both indoor and outdoor workers exposed to extreme temperatures.

OSHA can, however, respond to heat related complaints by enforcing the following:

² Limiting Heat Burden While Wearing Personal Protective Equipment (PPE)
https://www.cdc.gov/niosh/topics/heatstress/heat_burden.html

³ Regional Emphasis Program for Heat Illnesses (osha.gov) https://www.osha.gov/sites/default/files/enforcement/directives/CPL_2_02-00-027A.pdf



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- The **'General Duty Clause'** of the Occupational Safety and Health Act (OSHAct) of 1970. requires that "all employers provide a work environment "free from **recognized hazards** that are causing or are likely to cause death or serious physical harm," such as heat-related illnesses.
- OSHA's **Sanitation standard** (29 CFR 1910.141) requires employers to provide clean potable water to employees.
- In the event of an emergency, OSHA's **Medical Services and First Aid** standard (29 CFR 1910.151) requires an adequately trained person to be onsite and render first aid in an emergency if a designated medical facility is not in near proximity to the workplace.

OSHA also has an educational 'Campaign to Prevent Heat Illness' and provides helpful information on its *Occupational Exposure to Heat* webpage⁴. (www.osha.gov/heat-exposure)

On the state level, **California, Washington, Oregon, and Minnesota**, have issued heat protection standards of their own. Protections in Oregon's emergency standard, which is the most protective of them all, apply to both indoor and outdoor employees. The Oregon standard is triggered when the 'heat index' equals or exceeds 80 degrees Fahrenheit. The heat index is commonly known as the 'feels like temperature' and considers both temperature and relative humidity in its calculation. Fortunately, the heat regulations in both Oregon and Washington apply to vehicle cab environments that are not managed by fans or air conditioning.

Maryland and Virginia are also in the process of developing heat illness prevention standards.

What Can Teamster Members and Local Unions Do to Help Protect Members from Heat-related Illnesses?

- Demand that employers establish a written heat illness prevention plan with requisite policies, procedures, and training.
- Establish a joint labor-management safety and health committee at each workplace to address occupational hazards such as exposure to excessive heat and other environmental and workplace hazards on a continuing and consistent basis.
 - The IBT Safety and Health Department offers virtual training on how to establish effective safety and health committees and the role and function of the union in those committees.
- Jointly evaluate accidents and injuries (such as falling off a ladder or mishandling dangerous machinery) occurring in hot temperatures that may result in disciplining workers, to determine if heat may have played a role in the event.
- Ensure that heat-related illnesses are recorded by the employer on the OSHA 300 Form (Log of Injuries and Illnesses).
- Negotiate contract language on heat stress (contact the IBT Safety and Health Department).
- Initiate and lend support to Federal, State and local legislative efforts on heat illness awareness and prevention.

⁴ Heat - Overview: Working in Outdoor and Indoor Heat Environments | Occupational Safety and Health Administration
https://www.osha.gov/heat-stress/heat_burden.html



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Currently, the IBT Safety and Health Department offers training on heat stress through modules in the following courses:

- 10-Hr OSHA Construction Safety and Health Outreach Course
- 8-Hr HAZWOPER Refresher Course
- 40-Hr HAZWOPER Initial Site Worker Course, and
- Bloodborne Pathogens (BBP) and safety hazard crash investigation Training for Airline Go-Team workers.

Please refer to the IBT Safety and Health Department website, www.teamstersafety.org, for more information and resources and feel free to contact us at 202-624-6960.

More Information

Heat - Overview: Working in Outdoor and Indoor Heat Environments | Occupational Safety and Health Administration www.osha.gov/heat-exposure

Heat Stress Guide | Occupational Safety and Health Administration (osha.gov)
www.osha.gov/emergency-preparedness/guides/heat-stress

OSHA-NIOSH Heat Safety Tool App
www.cdc.gov/niosh/topics/heatstress/heatapp.html

Heat Stress | NIOSH | CDC www.cdc.gov/niosh/topics/heatstress/default.html
Occupational Exposure to Heat and Hot Environments | NIOSH | CDC
www.cdc.gov/niosh/docs/2016-106/default.html

California Code of Regulations, Title 8, section 3395. Heat Illness Prevention in Outdoor Places of Employment
www.dir.ca.gov/title8/3395.html

DOSH - Heat related illness prevention and information (ca.gov)
www.dir.ca.gov/dosh/heatillnessinfo.html

Oregon OSHA Heat Illness Prevention Rule Questions and Answers
<https://osha.oregon.gov/OSHARules/adopted/2021/heatillnessprevention-ga.pdf>

Oregon Occupational Safety and Health: Heat stress: State of Oregon
<https://osha.oregon.gov/Pages/topics/heat-stress.aspx>

Washington State Emergency Heat Exposure Rule for Outdoor Workers
<https://www.lni.wa.gov/news-events/article/?id=21-018>
<https://www.lni.wa.gov/rulemaking-activity/AO21-25/2125CR103EAdoption.pdf>



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Heat Exposure Educational Information

<https://lni.wa.gov/safety-health/safety-topics/search-by-topic?query=heatOutdoor>

MN OSHA Heat Stress Guide

https://mn.gov/admin/assets/heat_stress_guide_tcm36-207189.pdf

MN OSHA Compliance: Heat stress | Minnesota Department of Labor and Industry

<https://www.dli.mn.gov/business/workplace-safety-and-health/mnosha-compliance-heat-stress>