# Working in Extreme Heat




## WHAT'S AT STAKE?

**HEAT RELATED ILLNESS**

Outdoor workers who are exposed to hot and humid conditions are at risk of heat-related illness. The risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather.

**Heat Index**

For people working outdoors in hot weather, both air temperature and humidity affect how hot they feel. The **"heat index"** is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels, since sweat does not readily evaporate and cool the skin. The heat index is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources.

## WHAT'S THE DANGER?

**HEAT – RELATED ILLNESS**

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. Workers performing strenuous activity, workers using heavy or non-breathable protective clothing, and workers who are new to an outdoor job need additional precautions beyond those warranted by heat index alone.

**Outdoor Work**

Workers new to outdoor jobs are generally most at risk for heat-related illnesses. For example, Cal/OSHA investigated 25 incidents of heat-related illness in 2005. In almost half of the cases, the worker involved was on their first day of work and in 80% of the cases the worker involved had only been on the job for four or fewer days. That's why it's important to gradually increase the workload or allow more frequent breaks to help new workers and those returning to a job after time away build up a tolerance for hot conditions. Make sure that workers understand the risks and are "acclimatized".

**Outdoor workers** include any workers who spend a substantial portion of the shift outdoors. Examples include construction workers, agricultural workers, baggage handlers, electrical power transmission and control workers, and landscaping and yard maintenance workers. These workers are at risk of heat-related illness when the heat index is high. **Additional risk factors are listed below. These must be taken into consideration even when the heat index is lower.**

- Work in direct sunlight – adds up to 15 degrees to the heat index.
- Perform prolonged or strenuous work
- Wear heavy protective clothing or impermeable suits

Workers at greater risk of heat stress include those who are 65 years of age or older, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

### Overview

Working when it's hot puts stress on your body's cooling system. When ignored, it can lead to heat-related illness, disability and even death.

Heat stress can get worse when combined with:

- physical work
- loss of fluids
- fatigue
- a pre-existing medical condition

**Causes of Heat Stress**

Factors that can cause heat stress include:

- working in direct sunlight in the summer months.
- humidity in the workplace (more than 50% relative humidity).
- working in certain workplaces such as foundries, smelters, chemical plants, bakeries and commercial kitchens.
- working in mines, especially deep mines with geothermal gradients.
- working in mines with equipment that radiates heat.

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Exposure to extreme heat can result in occupational illnesses and injuries. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers as it may result in sweaty palms, fogged-up safety glasses, and dizziness. Burns may also occur as a result of accidental contact with hot surfaces or steam.

Workers at risk of heat stress include outdoor workers and workers in hot environments such as firefighters, bakery workers, farmers, construction workers, miners, boiler room workers, factory workers, and others.

## HOW TO PROTECT YOURSELF

**MANAGING HEAT STRESS/ILLNESS AT WORK**

**Ways to manage heat stress in the workplace**

Under the *Occupational Health and Safety Act*, employers must take every reasonable precaution in the circumstances for the protection of a worker.  This includes protecting your workers from heat stress in the following ways:

1. Design your workplace to reduce heat stress

If possible, start with engineering controls. For example:

- use machines (for example, hoists and lift-tables) to reduce the physical demands of work.
- control the heat at its source by using insulating and reflective barriers (for example, insulate furnace walls).
- exhaust hot air and steam produced by operations.
- use air conditioners to reduce the temperature and humidity.
- use fans if the temperature is below 35°C (if fans are used when the temperature is above 35°C they may recirculate the hot air, which can prevent cooling).
- provide:
    - cool, shaded **work** areas
    - air-conditioned **rest** areas

**2. Plan ahead to reduce heat stress**

Your workplace policies and procedures, schedule and training can help reduce the risk of heat stress. Administrative and work practice controls can include:

- assessing the demands of all jobs and putting a plan in place for hot days and workplaces.
- increasing the frequency and length of rest breaks.
- scheduling strenuous jobs to cooler times of the day such as in the early morning, late afternoon or night.
- providing cool drinking water near workers.
- reminding workers to drink a cup of water at least every 15 to 20 minutes to stay hydrated.
- cautioning workers to avoid direct sunlight.
- assigning more workers or slowing down the pace of work.
- making sure workers have time to acclimatize to a modified intensity of work.
- training workers to recognize the signs and symptoms of heat stress.
- starting a “buddy system” because people are not likely to notice their own symptoms.
- investigating any heat-related incidents reported by workers.
- making sure workers trained in First Aid are available and on-site
- creating an emergency response plan to respond to heat-related illnesses.
- advising workers who are pregnant or have a medical condition to consult their physician about working in the heat and make appropriate accommodations.

**3. Help workers adjust to hot environments**

The more time a worker has to acclimatize to a hot environment, the better their body handles the heat.

If workers have health problems or are not in good physical shape, they may need more time to adjust to hot environments.

For workers **with no experience** in hot conditions, there are two ways to help them tolerate the heat:

1. gradually increase the activity level over one to two weeks
2. gradually increase the amount of time spent in hot working conditions

For workers **with experience** in hot conditions, but who may have been ill or away from work for 9 or more days, the worker will need to gradually readjust to the heat.

**4. Encourage workers to wear suitable protective clothing**

Workers should:

- wear light and breathable summer clothing (if applicable).
- cover their head to prevent exposure to direct sunlight.
- wear reflective clothing in a high radiant-heat situation.
- consider air, water or ice-cooled insulated clothing for very hot environments.
- avoid clothing that isn't breathable, such as chemical protective clothing. If the workers must wear it, they should pay close attention to symptoms that suggest they may be ill due to heat

**FINAL TAKEAWAYS FOR WORKING IN EXTREME HEAT**

Here are **Six** things to keep in mind as you prepare for a hot summer:

1. **"Water. Rest. Shade."** Ideally, workers should drink about 1 cup of water every 15-20 minutes but they may need sports beverages containing balanced electrolytes if they are sweating for several hours at a time. Employers should make sure workers can access shaded or air-conditioned rest areas for cooling down as needed.
2. **New and temporary workers are most at risk**. The body needs time to build a tolerance to heat, which is why more than 70% of outdoor heat fatalities occur during a worker's first week of working in warm or hot environments. The process of building tolerance is called "heat acclimatization." Learn how to create a heat illness prevention plan and be sure to supervise new employees until they are fully acclimatized.
3. **Indoor workers also can suffer from heat illness.** Kitchens, laundries, warehouses, foundries, boiler rooms and many other work environments can become dangerously hot.
4. **Use engineering controls or modify work practices to protect employees.** For example, try increasing ventilation, using cooling fans, scheduling work at a cooler time of the day, and rotating job functions among workers to minimize heat exposure.
5. **Familiarize everyone at your workplace with the signs and symptoms of heat illness and make sure everyone knows what to do in an emergency.**
    - Common heat exhaustion signs are dizziness, headaches, cramps, sweaty skin, nausea and vomiting, weakness and a fast heartbeat. Heatstroke symptoms may include red, hot, dry skin; convulsions; fainting; very high temperature and confusion.
    - Pair workers with a buddy to observe each other for early signs and symptoms of heat intolerance.
    - Employees should call a supervisor for help if they believe someone is ill – and 911 if a supervisor is not available, or if someone shows signs of heatstroke.
6. **Download the OSHA-NIOSH Heat Safety App on your iPhone or Android device** to help calculate the heat index at your worksite. The app provides specific recommendations for planning work activities and preventing heat illness based on the estimated risk level where you are working.

## FINAL WORD

A healthy human body temperature is 37°C. A change of body temperature exceeding 1°C can be an indication of illness or environmental conditions beyond the body's ability to cope. Working in very hot temperatures can be dangerous to your health, causing heat stroke, heat exhaustion or fainting.