Hot Environments

Hot Environments - Overview

On this page

How does working in a hot environment affect a worker's health and safety?

Whether work is done indoors in a hot smelting plant or outdoors in the summer months, heat exposure can be dangerous. Workers who are exposed to extreme heat or work in hot environments may be at increased risk of heat stress.

Very hot environments can increase your internal body temperature several degrees above the normal temperature of 37°C, overwhelming your body's natural cooling systems and leading to a variety of serious and possibly fatal health effects, including heat exhaustion and heat stroke. Please see the OSH Answers Hot Environments – Health Effects and First Aid for more information on the health effects associated with heat stress.

A heat stress program can mitigate risks associated with hot environments. For more information, please see the OSH Answers Hot Environments - Control Measures.

This document focuses on work done in hot conditions. Please also see the OSH Answers documents Temperature Conditions - Cold, Thermal Comfort For Office Work, and Humidex Rating and Work for more information on work in other conditions.

What occupations are at risk of heat stress?

Anyone working in hot environments can be at risk of heat stress, including:

- Abatement workers
- Bakers
- Construction workers (building, highway, street, bridge)
- Cooks
- Farmers and farm workers
- Firefighters
- Foundry workers
- Glass blowers
- Iron and steel mill workers
- Landscapers
- Letter carriers
- Mining workers
- Oil and gas workers
- Sawmill workers

Certain activities can put workers at greater risk, such as:

- Working on a roof
- Digging trenches
- Painting outdoors
- Residential framing
- Cutting down trees
- Garbage collection
- Highway construction
- Asbestos remediation
- Oil and gas well drilling
- Repairing air conditioning units

Each workplace is unique, and the employer is required to take every reasonable precaution to protect workers. In workplaces where workers may be exposed to heat, a risk assessment must be conducted, and appropriate control measures must be implemented.

Is there a maximum temperature to which workers can be exposed at work?

In most cases, not really. Legislation is not always specific about what is an acceptable range for temperature conditions at work, especially when working outdoors.

How temperature is felt, or the overall heat load, depends on several factors, including:

- relative humidity
- exposure to the sun or other heat sources
- amount of air movement
- work demands - i.e., how physically demanding the work is
- is the worker acclimatized or unacclimatized to the workload under the conditions of work
- what clothing is worn (including protective clothing)
- what is the work-rest regimen (percent (%) time work vs. percent (%) time rest break)

Therefore, instead of a single upper limit, workplaces use a range of acceptable temperatures for specific circumstances. The Threshold Limit Values® (TLVs®) for heat stress as published by the American Conference of Governmental Industrial Hygienists (ACGIH) have been formally adopted as occupational exposure limits in some jurisdictions, while other jurisdictions use these TLVs® as guidelines. See the OSH Answers Temperature Conditions - Legislation for a list of legislation from each jurisdiction.

For more information about the range of acceptable working temperatures and additional control measures for heat exposure, see our OSH Answers document Hot Environments – Control Measures.

What are the warning signs of heat stroke?

A serious health and safety concern in a very hot environment is heat stroke, which can be fatal if medical attention is not available immediately. Heat exhaustion and fainting (syncope) are also types of heat-related illnesses, which are not fatal but can interfere with a person's ability to work.

The victims of heat stroke are unable to notice the symptoms when they are happening to themselves, and therefore, their survival depends on co-workers' ability to identify symptoms in others and to get medical help.

While symptoms can vary from person to person, the warning signs of heat stroke can include complaints of sudden and severe fatigue, nausea, dizziness, light-headedness, and may or may not include sweating. If a co-worker appears to be disoriented or confused (including euphoria) or has unaccountable irritability, malaise or flu-like symptoms, the worker should be moved to a cool location and get medical help immediately.

For more information, please see our OSH Answers documents on Hot Environments - Health Effects and First Aid.

Are there any general guidelines about temperature?

Yes. Two types of exposure limits are often used: occupational exposure limits and thermal comfort limits.

Occupational exposure limits are to protect workers in a variety of settings, such as health care, industrial, construction, and mining, from heat-related illness. For non-office workplace situations, occupational health and safety jurisdictions generally use the TLVs® for heat stress and strain as published by the ACGIH. As mentioned above, some Canadian jurisdictions have adopted these TLVs as occupational exposure limits, and others use them as guidelines to control heat stress in the workplace.

These limits are given in units of wet bulb globe temperature (WBGT) degrees Celsius (°C). The WBGT unit takes into account environmental factors, including air temperature, humidity, and air movement, which contribute to people's perception of hotness. In some workplace situations, solar load (heat from radiant sources) is also considered in determining the WBGT. Only qualified professionals, whether they are in-house staff, consultants, or from the local occupational health and safety jurisdiction, should perform the measurement and interpret the results. More information about occupational exposure limits and WBGT is available in the OSH Answers document Hot Environments - Control Measures.

Thermal comfort limits are typically for office workplaces to ensure productivity and quality of work. Please see the OSH Answers document Thermal Comfort for Office Work for more information.

What about humidex?

The weather broadcast service of Environment Canada uses the humidex scale to inform the public about hot weather conditions. However, workplace humidex is based on actual humidity and temperature measurements in the work area, not weather stations or media reports. Humidex scale quantifies human discomfort due to perceived heat, taking into account the effect of air temperature and relative humidity. For a given temperature, the humidex increases as the relative humidity (moisture content) of the air becomes higher. Under certain workplace conditions, the humidex may serve as an indicator of discomfort resulting from occupational exposure to heat.

Please see the OSH Answers document Humidex Rating and Work for more information.

What should be done when it is very hot or humid?

Employers have a duty to take every reasonable precaution to ensure the workplace is safe for the worker. This duty includes taking effective measures to protect workers from heat stress disorders if it is not reasonably practicable to control indoor conditions adequately, or where work is done outdoors.

Certain steps can be taken to reduce discomfort. These include:

- using tents, screens, or umbrellas to create shade
- allowing flexibility to permit less physically demanding activities during peak temperature periods
- using fans or air conditioning, or allowing access to cooler areas for rest breaks
- taking more frequent rest breaks
- wearing light, loose-fitting clothing
- drinking cold beverages (ones that do not have caffeine or alcohol)

More information about ways to control heat stress is available in the OSH Answers document Hot Environments - Control Measures.

How does climate change affect working in hot environments?

Climate change is increasing the frequency and intensity of extreme weather events, including extreme hot temperatures. According to Canada's Climate Change report (2019), the average annual temperature in Canada has increased by a best estimate of 1.7°C since 1948 and is projected to continue increasing between 1.8°C and 6.3°C by the end of the century. Warming has been occurring even more quickly in northern Canada.

The effects of warmer weather include more extreme heat events, which can cause significant health issues such as heat exhaustion, heat stroke, and other heat stress-related illnesses.

Higher temperatures for longer periods of time can increase the risk of injuries due to fatigue, lack of concentration, poor decision-making, and other factors. A reduction in productivity may also occur.

Please see the OSH Answers Climate Change: Extreme Weather – Heat for more information.

Where can I find more information?

Please see the following OSH Answers documents:

- Temperature Conditions - Cold
- Temperature Conditions - Legislation
- Hot Environments - Health Effects and First Aid
- Hot Environments - Control Measures
- Humidex Rating and Work
- Thermal Comfort for Office Work
- Climate Change: Extreme Weather - Heat

Fact sheet last revised: 2025-06-23

Disclaimer