

POST Safety bulletin



Heat Stress: How to work safely in hot weather

Engaging in physical activity where it is hot puts stress on the body’s cooling system. The harder your body works, the more heat it has to dissipate to maintain temperature equilibrium. Environmental heat stress can place additional strain on your body that may lead to fatigue, dehydration, heat-related illnesses and possibly even death.

In foundries, steel mills, bakeries, smelters, glass factories, and furnaces, extremely hot or molten material is the main source of heat. In outdoor occupations, such as construction, road repair, open-pit mining and agriculture, summer sunshine is the main source of heat. In laundries, restaurant kitchens, and canneries, high humidity adds to the heat burden. In all instances, the cause of heat stress is a working environment which can potentially overwhelm the body’s ability to deal with heat.

Most people feel comfortable when the air temperature is between 20°C and 27°C and the when relative humidity ranges from 35 to 60%. When air temperature or humidity is higher, people feel uncomfortable. Such situations do not cause harm as long as the body can adjust and cope with the additional heat. Very hot environments can overwhelm the body’s coping mechanisms leading to a variety of serious and possibly fatal conditions.

When the air temperature or humidity rises above the optimal ranges for comfort, problems can arise. The first effects are subjective in nature - they relate to how you feel. Exposure to more heat stress can cause physical problems which impair workers' efficiency and may cause adverse health effects.

What are heat cramps?

Heavy sweating drains a person’s body of salt, which cannot be replaced by drinking water alone. Heat cramps are painful cramps in the arms, legs, or stomach, which can occur at work or later at home. If an individual suffers heat cramps, medical attention should be sought immediately.

What is heat exhaustion?

Symptoms of heat exhaustion include:

- Heavy sweating
- Cool moist skin
- Strong thirst
- Quick pulse
- Rapid breathing
- Feeling of fatigue and possible fainting

The individual will appear tired, weak, clumsy, confused and thirsty. It is important that the worker rest in a cool area as soon as possible, because heat exhaustion can lead to heat stroke. **Proceed to seek medical attention if conditions don’t** subside or worsen. (Normal body temperature is approximately 37.2 C)

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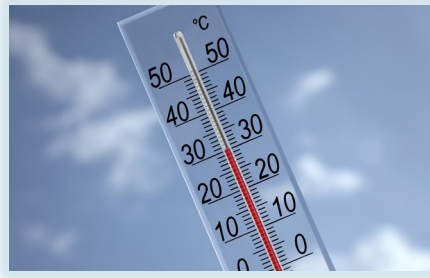
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What is heat stroke?

Symptoms of heat stroke include:

- High body temperature ($>40^{\circ}\text{C}$)
- Very hot, red and dry skin
- Tiredness / confusion
- Very rapid pulse
- May suffer convulsions



Heat stroke symptoms can lead to death so it is imperative that medical attention is received immediately!

How can we control heat stress?

Stay hydrated

Drink plenty of water - frequently (equivalent of about one litre every hour) - in hot weather conditions whether you feel thirsty or not to replace the fluid loss. Avoid consuming caffeine and alcohol, which can dehydrate you

Engineering Controls

Engineering controls are the most effective means of reducing excessive heat exposure. The examples which follow illustrate some engineering approaches to reducing heat exposure.

- **Reducing Metabolic Heat Production (heat produced by the body):** Automation and mechanization of tasks minimize the need for heavy physical work and the resulting buildup of body heat.
- **Reducing the Radiant Heat Emission from Hot Surfaces:** Covering hot surfaces with sheets of low emissivity material such as aluminum or paint that reduces the amount of heat radiated from this hot surface into the workplace.
- **Insulating Hot Surfaces:** Insulation reduces the heat exchange between the source of heat and the work environment.
- **Shielding:** Shields stop radiated heat from reaching work stations. Two types of shields can be used. Stainless steel, aluminum or other bright metal surfaces reflect heat back towards the source. Absorbent shields, such as a water-cooled jackets made of black-surfaced aluminum, can effectively absorb and carry away heat.
- **Ventilation and Air Conditioning:** Ventilation, localized air conditioning, and cooled observation booths are commonly used to provide cool work stations. Cooled observation booths allow workers to cool down after brief periods of intense heat exposure while still allowing them to monitor equipment.
- **Reducing the Humidity:** Air conditioning, dehumidification, and elimination of open hot water baths, drains, and leaky steam valves help reduce humidity.

Administrative Controls

The following administrative controls should be taken into account when planning work-rest schedules:

- Perform high intensity workloads first thing in the day followed by lower intensity workloads.
- Have workers share or help each other for the highly physical tasks to reduce the stress on their bodies.
- Reduce the work pace to a comfortable level, especially if the workers are un-acclimatized to the heat.
- Students and new employees will need a week or so to become acclimatized to the hotter environments.
- If reflective safety vests are resulting in excessive sweating a reflective t-shirt may be a better option.

The CCHOS' publication *Working in Hot Environments: Health and Safety Guide* provides Practical guidance for the identification, assessment and control of the health and safety hazards related to working in hot environments and applicable legislation, standards and guidelines addressing heat stress.

The guide is available through the CCOHS website at www.ccohs.ca or visit the POST website at www.POSTtraining.ca for links.

References: Canadian Centre for Occupational Health & Safety