

Cold Environments

Cold Environments - Overview

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Why should we be concerned about working in the cold?

Working in cold environments can be hazardous to your health, including life-threatening illnesses. It is critical that the body be able to preserve its core body temperature steady at 37°C (98.6°F). This thermal balance must be maintained to maintain normal body functioning and provide energy for activity or work. When the body temperature is too low, it can affect the brain, making it difficult for a worker to think clearly or move well.

The body's ability to generate heat (our metabolism) must be able to overcome the challenges presented by low temperature, wind and wetness.

This document focuses on working in cold conditions. Please see the OSH Answers [Hot Environments - Overview](#) and [Humidex Rating and Work](#) for more information on temperature conditions.

How does cold affect work performance?

Uncomfortably cold working conditions can lead to lower work efficiency and higher incident rates. Cold-related discomfort reduces mental alertness and impairs the performance of complex mental tasks.

Manual tasks are also impaired because the sensitivity and dexterity of fingers are reduced in the cold. At even lower temperatures, the cold affects the deeper muscles resulting in reduced muscular strength and stiffened joints.

For all these reasons, incidents are more likely to occur in very cold working conditions.

What are some jobs where cold may be a hazard?

Workers at risk of cold stress include:

- Outdoor workers, including:
 - Road builders, house builders, and other construction workers
 - Hydro and telecommunications linemen
 - Police officers, firefighters, emergency response workers, military personnel
 - Transport workers, bus, and truck drivers
 - Fishers, hunters, trappers
 - Divers
 - Workers in refrigerated warehouses
 - Meat packaging and meat storage workers
 - Outdoor recreation workers (and enthusiasts)
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Is there a minimum temperature at which work becomes dangerous and should be stopped?

The short answer is yes.

At very cold temperatures, the most serious concern is the risk of hypothermia or dangerous overcooling of the body. Another serious effect of cold exposure is frostbite or freezing of the exposed extremities such as fingers, toes, nose, and ears. Hypothermia could be fatal in the absence of immediate medical attention.

What are the warning signs of hypothermia?

Warning signs of hypothermia can include complaints of nausea, fatigue, dizziness, irritability, or euphoria. Workers can also experience pain in their extremities such as the hands, feet, and ears, and shivering. Workers showing signs of hypothermia should be moved to a heated shelter and get medical help immediately.

Are there exposure limits for working in cold environments?

In Canada, legislation from some jurisdictions provides a [range of acceptable temperatures](#) for specific circumstances, including minimum temperatures for indoor environments. In other cases, occupational health and safety jurisdictions use the Threshold Limit Values® for cold stress published by the American Conference of Governmental Industrial Hygienists (ACGIH). Some Canadian jurisdictions have adopted these TLVs® as legal occupational exposure limits, and others use them as guidelines.

Where there are no maximum or minimum exposure limits for cold working environments, there are guidelines that can be used to assess hazards, create safe work plans, and monitor conditions to protect the health and safety of workers. Where there are differences between the recommendations made by various organizations (and where there are no established limits or guidelines from your jurisdiction), employers are encouraged to choose a system that best provides protection for their workforce.

For example, ACGIH (2024) suggests a work-warming regimen when work is done continuously in the cold when the wind chill temperature is at or below -7°C (19.4°F). In these conditions, heated warming shelters such as tents, cabins, or restrooms should be made available nearby and used regularly. Workers should be encouraged to use these shelters, depending on the severity of the exposure. If signs of cold stress are noticed, workers should return to the shelter immediately.

For work at or below -12°C (10.4°F), work should include:

- constant observation (supervisor or buddy system)
- adjusting the pace or rate of work so that it is not too high and cause heavy sweating that will result in wet clothing
- time for new employees to become accustomed to the conditions
- adjustments considering the weight and bulkiness of the clothing when estimating work performance and weights to be lifted by the worker
- arrangements to minimize sitting and standing for long periods
- instructions in safe work practices, re-warming procedures, proper clothing practices, proper eating and drinking habits, recognition of cold stress/frostbite, and signs and symptoms of hypothermia or excessive cooling of the body (including when shivering does not occur)

What should be done when working in cold environments?

Employers have a duty to take every reasonable precaution to make sure the work site is safe for the worker. This duty includes taking effective measures to protect workers from cold stress injuries.

General recommendations include to:

- Dress in layers of warm clothing, with an outer layer that is wind-resistant in windy weather, or waterproof in wet weather.
- Cover as much exposed skin as possible.
- Wear a hat, mittens or insulated gloves, a scarf, neck tube or face mask, and insulated, waterproof footwear.
- Stay dry (including taking steps to prevent excess sweating).
- Keep active.
- Maintain a work/break schedule. Take breaks in a warm area protected from drafts.
- When the weather is very cold, consider rescheduling outdoor work activities.

Please see the OSH Answers document [Cold Environment - Control Measures](#) for more information.

Where can I find more information?

Please see the following OSH Answers documents:

- [Cold Environments - Control Measures](#)
- [Cold Environments - Health Effects and First Aid](#)
- [Hot Environments - Overview](#)
- [Temperature Conditions - Legislation](#)
- [Thermal Comfort for Office Work](#)

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