

Cold Stress – Compliance Game Plan



The 6 steps you must take to protect workers from hypothermia, frostbite and other cold stress hazards.

The human body functions normally at a 'core' temperature of 36°C/98.6°F. If core temperature drops too low it can lead to fatal and serious injuries including:

- **Hypothermia**, which can occur when the body loses heat faster than it can replenish it, sometimes resulting in death;
- **Frostbite**, or the actual freezing of the skin which can lead to amputation; and
- **Trench foot**, or freezing of the foot caused by immersion in cold water or prolonged exposure to extremely cold air.

Construction, fishing, maritime, forestry, oil well, mining, farming and others who work outdoors in the winter are particularly vulnerable. But cold stress is an all-season hazard for those who work inside freezers and other indoor cold environments.

What the Law Requires

Most jurisdictions have specific OHS regulations requiring employers to protect workers from cold stress.

In Alberta and Ontario, protecting workers from cold stress is implied under the part of the OHS Act imposing a general duty on employers to implement reasonable or reasonably practicable measures to protect workers' health and safety.

6-Step Cold Stress Compliance Game Plan

No matter what part of Canada you're in, you must take 6 basic steps to prevent cold stress hazards.

Step 1: Do a Cold Stress Hazard Assessment

First, have a competent person do a hazard assessment at your workplace to determine whether workers are exposed to thermal conditions that could cause a worker's core body temperature to fall below 36°C/96.8°F. Consider all factors

affecting how cold the air actually *feels* on a worker's body, including:

- **Temperature:** If temperatures drop below -1.11ø C/30øF, you have a potential problem;
- **Wet and Damp Conditions:** Wetness chills the body and increases the risk of cold stress;
- **Wind and Wind Chill:** The combined effect of cold air and wind speed is called 'equivalent chill temperature' (ECT) or 'wind chill,' which is the temperature the body actually feels;
- **Contact with Cold Surfaces or Water:** Contact with something cold chills the body and increases cold stress risk;
- **Workers' Physical Condition:** Consider the age, weight, fitness and acclimatization, i.e., whether workers are used to working in cold conditions;
- **Movement and Exertion:** Moving around and doing intense physical work warms the body while standing around allows the thermal conditions to drop body temperature more easily; and
- **Clothing:** Clothing can insulate the body, helping it maintain body temperature.

OHSI Resources

Cold Stress Hazard Assessment Checklist

Model Cold Stress Checklist

Step 2: Maintain Safe Outdoor Thermal Conditions

All jurisdictions require employers to take measures to keep workers warm and comfortable. Six jurisdictions (BC, MB, NB, NL, NS, PEI) require employers to limit exposure to Threshold Limit Values (TLVs) levels classified as posing 'little danger' to workers under the American Conference of Governmental Industrial Hygienists (ACGIH) method of calculating and preventing cold stress. In Ontario, MOL guidelines say that employers must maintain ACGIH TLVs levels even though the duty isn't spelled out in the OHS Regulations.

Step 3: Maintain Safe Indoor Thermal Conditions

Six jurisdictions (FED, NB, NL, ON, PEI, QC) also specify a range of acceptable *indoor* temperatures for different situations or locations, e.g., 20'C for non-physical work done while standing.

Step 4: Select Cold Stress Hazard Controls

As with other hazards, you must follow the so called 'hierarchy of controls' approach in deciding how best to protect workers from the cold stress hazards you identify.

First Choice: Elimination

If reasonably practicable, completely eliminate the cold stress hazard, such as by not performing outdoor operations in winter or turning off and letting indoor freezers warm up before workers enter.

Second Choice: Engineering Controls, Work Controls & PPE

If elimination isn't reasonably practicable, you must use a combination of engineering and work/administrative controls and PPE to minimize cold stress hazards.

Engineering controls for cold stress include systems and devices that make the air warmer, such as:

- Heating and ventilating systems for indoor workplaces;
- Use of radiant heaters at outdoor sites;
- Erecting shields or other barriers to block the wind and reduce wind chill; and
- Maintaining 'warm-up stations' inside buildings or trailers.

Work/Administrative controls reduce cold stress hazards by changing the methods of carrying out the work. Strategy: Implement a cold stress prevention policy that includes safety measures such as:

- Developing safe work procedures for cold weather operations;
- Scheduling regular outdoor maintenance and repair jobs for warmer months;
- Scheduling the most exerting work for the warmest part of the day;
- Letting workers take frequent warm-up breaks;
- Providing a nearby heated shelter where workers can take warm-up breaks (mandatory in BC, NB and QC);
- Making sure workers stay hydrated by drinking plenty of fluids and avoiding caffeine and alcohol;
- Having workers operate in pairs so they can keep an eye on each other;
- Monitoring weather conditions during the work;
- Monitoring the pulse and other vital signs of exposed workers;
- Ensuring that somebody is available at the scene who's trained to provide first aid in case workers exhibit signs or symptoms of cold stress;
- Implementing emergency response procedures for cold stress;
- Acclimatizing, i.e., getting workers used to working in the cold; and
- Providing workers safety information and training (See Step 3 below).

PPE and protective clothing that exposed workers should wear to protect against cold stress may include 3 layers of outer clothing, hats and hoods, face covering and insulated, water-proof gloves and boots.

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Model Cold Stress Exposure Control Policy

Model Cold Stress Checklist

Cold Work Warm Break Schedule

Cold Weather Acclimatization Procedure

Cold Weather Monitoring Procedure

Cold Weather Safe Work Procedures

Cold Work Warm Up Break Schedule

Cold Stress Emergency Response Procedure

Model Space Heater Safety Checklist

Step 5: Provide Cold Stress Safety Training

Worker education and training are crucial to preventing cold stress. By the time they complete their training, workers need to understand:

- What cold stress is;
- Why it's dangerous;
- How to protect themselves from the danger;
- How to recognize the signs and symptoms of the different forms of cold stress; and
- How to respond if they or a co-worker exhibits such signs or symptoms.

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Model Cold Stress Train the Trainer Gameplan

Model Cold Stress Exposure Control Policy

Step 6: Monitor Your Controls

You need to continually monitor the controls you implement to ensure they're effective, identify problems and make the necessary corrections. Review should be undertaken on a regular basis and in response to incidents and changes in work operations or conditions that may alter or weren't addressed in the current assessment.

OHSI Resources

Model Cold Stress Exposure Control Policy

Model Cold Stress Checklist