



Cold Stress: Protecting Outdoor Workers in Winter Months

The main cold-stress risk factor is extreme cold. Near-freezing temperatures can be considered extreme cold in locations that do not normally experience winter weather.

Other factors that increase the risk of cold stress are:

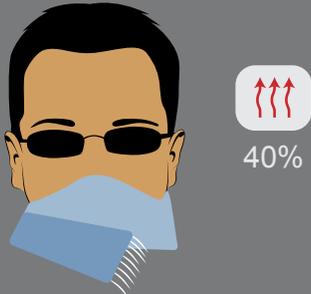
- Wetness/dampness, dressing improperly, and exhaustion.
- Predisposing health conditions such as hypertension, hypothyroidism, and diabetes.
- Poor physical conditioning.

The three most common types of cold stress are **hypothermia** (when body heat is lost faster than it can be replaced), **frostbite** (an injury to the body that is caused by freezing of the skin and underlying tissues), and **trench foot**

(caused by prolonged exposure to wet and cold temperatures; to prevent heat loss, the body constricts the blood vessels to shut down circulation in the feet).³

Dressing properly is one of the best ways to prevent all types of cold stress. Layering and fabric selection are two important things to remember when dressing for winter weather. When layering, wearing at least three layers of loose-fitting clothing is best practice. The outer layer should be wind- and rain-resistant to help keep the body warm and dry. Using insulated and waterproof gloves and boots will help to prevent frostbite and waterproof boots will help to prevent trench foot.

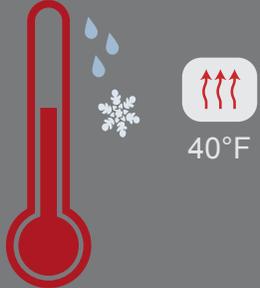
“Wearing at least three layers of loose-fitting clothing is best practice.”



Up to **40% of body heat** can be lost when the head is left exposed.¹



Wet feet lose heat **25 times faster** than dry feet.²



Hypothermia can occur at air temperatures **above 40°F** if a worker becomes chilled from rain or sweat.²

Preventing Winter Falls

Working and walking in winter weather conditions can be hazardous.

Snow and ice present extra hazards; wet ice is especially hazardous, as it is the slipperiest surface that has been tested. Below are some ideas for preventing winter slips and falls:⁴

- Inspect footwear in preparation for winter weather. If treads or laces are found to be worn they should be replaced, or new footwear should be purchased.
- Some footwear that works great in warmer months may not work so well in the cold. If boots are to be worn year-round, it is a good idea to contact the manufacturer about the boots' slip resistance in cold weather before purchasing.
- Consider using studded footwear or overshoe cleats in snow and ice as they provide extra protection on wet ice.
- Treat boots and leather footwear with waterproofing to keep feet dry and help prevent trench foot. This also increases the life of leather footwear.
- When walking in winter conditions, look where you are going, and if possible, have your hands ready to steady yourself in case you slip.
- Avoid walking on metal surfaces at the start of the day. Wait until the sun has melted the frost.
- Avoid carrying heavy loads. Use material handling equipment whenever possible.



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Takeaways

1. Dress in loose layers when working in extreme cold.
2. Consider studded footwear or overshoe cleats as they provide extra protection on wet ice.
3. Inspect footwear before the start of the winter season.
4. For more information on preventing winter injuries and illnesses, see reference note *Working Outdoors in Cold Weather*, RC 5093, on Liberty Mutual SafetyNet™.

1. Princeton University. (2017). *Cold stress facts*. Retrieved from <https://ehs.princeton.edu>
2. United States Department of Labor. (n.d.). *Cold stress*. Retrieved from <https://www.osha.gov>
3. Occupational Safety and Health Administration. (n.d.). *Cold stress guide*. Retrieved from <https://www.osha.gov>
4. EHS Today. (January 2017). *Safety tips to prevent winter-related workplace accidents*. Retrieved from <http://www.ehstoday.com>

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