

Summary

E&B has developed this Program to protect employees who are exposed to excessive cold or who work in cold environments while at work. Various reasons can contribute to cold stress such as low air temperature, cool high wind, dampness, and cold water. Cold stress can result in hypothermia, frostbite, windburn, chilblains or trench foot.

Scope

This Program applies to all employees who are exposed to or may become exposed to excessive cold during the course of performing their job duties. E&B requires that all company employees affected by cold weather be trained on how to administer first aid in the event of cold induced injuries or illnesses.

Responsibility

Environmental Health & Safety (EHS):

- Assisting departments in implementing the provisions of this Program;
- Updating the Program as necessary;
- Validating Program implementation;
- Providing training and education resources regarding cold stress; and
- Performing cold exposure assessments for employees.
- Determining and reporting outdoor wind chill index to effected departments as specified in this Program; and
- Providing emergency heat when necessary.
- Initial and annual refresher training are required for all employees who will be exposed to cold weather hazards
- All employees are required to be trained in first aid measures to respond to cold weather injuries or illnesses

Supervisors:

Supervisors are required to:

- Provide proper hydration to employees exposed to cold weather temperature extremes?
- Identify the jobs, tasks, and/or company employees who are at risk for cold exposure and conduct a risk assessment based on job classification.
- Ensure all employees exposed to cold weather receive initial and annual training regarding the hazards of cold stress, the health effects, proper rewarming procedures, how to recognize symptoms of cold weather injuries, first aid techniques, protective clothing, the company's buddy system, procedures to follow in the event of vehicle breakdowns, and proper hydration and eating habits for cold weather work.
- Ensure employees are trained in identifying the signs and symptoms of cold-related illnesses such as the hazards of working in cold weather environments, the signs and symptoms of cold weather exposure to personal health such as frostbite, trench foot, wind burn, and hypothermia.

- Assessing employees work load and assigning work and rest schedules as needed;
- Monitoring the wind chill index and pursuing, implementing, and enforcing the use of proper protective equipment (PPE) for employees as specified in this Program;
- Notifying EH&S for the respective campus of specialized job task or environments, as defined in this Program, that require a cold exposure assessment;
- Reporting the results of all cold exposure assessment to employees; and 4
- Following their respective campus procedure for reporting occupational injuries and illnesses.

Employees:

- Working in accordance with the provisions of this Program;
- Understanding the signs and symptoms of cold-related illnesses;
- Notifying the supervisor if conditions exist that may lead to a cold-related illness; and
- Notifying the supervisor if they experience symptoms of a cold-related illnesses.

Protecting Employees

The EH&S Office has developed protective criteria for employees based upon the wind chill and other measures of cold stress exposure. The wind chill factor combines both air temperatures and wind speed into a single unit. The lower the wind chill the colder the environment will feel and the greater the risk that employees will experience a cold-related illness. Individual vulnerability to cold-related illness can vary widely between employees. Risk factors include: wetness/dampness; proper dress; exhaustion; predisposing health conditions such as hypertension, hypothyroidism, and diabetes; and poor physical conditioning. Employees gradually acclimatize when exposed to cold conditions. This may take several weeks. When the wind chill is low, special precautions are needed to protect un-acclimatized employees while they adjust to the cold particularly on the first few days they are exposed to cold conditions. Supervisors should monitor employees closely for signs of cold stress during this period and they should adopt appropriate work-rest schedules for these employees, starting with longer rest periods, that are adjusted over a two week period. Re-acclimatization may also be necessary when employees are away from the cold conditions for a few days.

Outdoor environments

For employees working outdoors without heat, scheduled breaks in warm areas are appropriate (Appendix B). Employees should drink warm sweet beverages and take breaks in warm areas as needed. Supervisors should consider scheduling the most work for the warmest part of the day, assigning extra employees to high demand tasks that will require longer periods in cold areas. All employees should watch out for the safety of their coworkers and work in pairs. 5

Acclimatization

A new employee should not be required to work in the cold for an extended time during the first days of employment until they become adjusted to the working condition and required protective clothing. New employees should be introduced to the work schedule slowly and trained accordingly.

Personal protective equipment

PPE is an important factor in preventing cold-related illnesses and injuries. Employees should adhere to the following recommendations when dressing for work in a cold environment:

- Wearing of three layers of clothing. An inner layer of wool, silk, or synthetic to wick moisture away from the body, a middle layer of wool or synthetic to provide insulation, particularly when wet, and an outer layer of protection against wind and rain that allows proper ventilation. Open layers to regulate body temperature, provide additional ventilation to avoid the wetting effects of perspiration. Perspiration is as dangerous as rain or other moisture.
- Wear a hat or hood (up to 40 percent of body heat can be lost when the head is left exposed);
- Wear insulated boots or other footwear and wool socks.
- Do not wear tight clothing (loose clothing provides better ventilation); and
- Keep a change of clothing available in case work clothes become wet.
- Do wear insulated face protection
- Do wear insulated head protection
- Do wear insulated ear protection
- Do wear wind vests, wind-blocking jackets
- Do wear over suits, warming vests
- Do wear hand warmers, foot warmers
- Do wear insulated gloves
- Do wear wind and water insulated clothing
- Do wear cold insulated footwear
- Do wear ice cleats, slip resistant footwear
- Do wear glare protection such as UV protected sunglasses or goggles

Proper Hydration

Proper hydration of affected company employees to prevent cold related injuries is required. Supervisors must provide plenty of liquids to affected workers and discourage the use of caffeine and alcohol that can lead to dehydration. Work must be scheduled so that work is performed in the warmest part of the day when possible. All affected employees are encouraged to take frequent breaks and to eat a high calorie diet to maintain energy. Supervisors and employees are to continually monitor co-workers for the initial signs of cold weather injuries.

Cold related illnesses and emergencies

If employees report or supervisors observe signs and symptoms of a cold-related illness, stop all activity immediately. Hypothermia and frostbite are medical emergencies. Call for Emergency Medical help immediately if an employee shows any sign of a cold-related illness/injury. The following are some common cold weather injuries.

Immersion/Trench Foot

Trench foot is a non-freezing injury of the feet caused by prolonged exposure to wet and cold conditions. It can occur in temperatures as high as 60°F if feet are constantly wet. Injury occurs because wet feet lose heat 25-times faster than dry feet. [CDC/NIOSH]

What are the symptoms of trench foot? Redness of the skin, numbness, tingling, pain, swelling, leg cramps, blisters, bleeding under the skin, and Gangrene.

First Aid

- Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible.
- Remove wet shoes/boots and wet socks.
- Dry the feet and avoid working on them.
- Keep affected feet elevated and avoid walking on feet as this may cause tissue damage and seek medical attention.

Frostbite

Frostbite is caused by the freezing of the skin and tissues. Frostbite can cause permanent damage to the body, and in severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures.

What are the symptoms of frostbite?

Reddened skin develops gray/white patches in the fingers, toes, nose, or ear lobes; tingling, aching, a loss of feeling, firm/hard, and blisters may occur in the affected areas.

First Aid

- Get into a warm room as soon as possible.
- Unless necessary, do not walk on frostbitten feet or toes.
- Follow the recommendations described above for hypothermia.
- Protect the frostbitten area, e.g., by wrapping loosely in a dry cloth and protect the area from contact until medical help arrives.
- DO NOT rub or massage the affected area, because rubbing causes damage to the skin and tissue.
- DO NOT try to re-warm the frostbitten area before getting medical help, for example, do not use heating pads or place in warm water. If a frostbitten area is rewarmed and gets frozen again, more tissue damage will occur. It is safer for the frostbitten area to be rewarmed by medical professionals.
- Give warm sweetened drinks if alert (no alcohol).

Hypothermia

Hypothermia occurs when the normal body temperature (98.6°F) drops to less than 95°F. Exposure to cold temperatures causes the body to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Hypothermia is most likely at very cold temperatures, but it can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat, or immersion in cold water.

What are the symptoms of hypothermia?

An important mild symptom of hypothermia is uncontrollable shivering, which should not be ignored. Although shivering indicates that the body is losing heat, it also helps the body to rewarm itself. Moderate to severe symptoms of hypothermia are loss of coordination, confusion, slurred speech, heart rate/breathing slow, unconsciousness and possibly death. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know what is happening and won't be able to do anything about it.

First Aid

- Call 911 immediately in an emergency:
- Move the worker to a warm room or vehicle.
- Remove any wet clothing and replace with dry clothing. Wrap the entire body (including the head and neck) in layers of blankets; and with a vapor barrier (e.g. tarp, garbage bag) Do not cover the face.
- Give warm sweetened drinks if alert (no alcohol), to help increase the body temperature. Never try to give a drink to an unconscious person.
- Place warm bottles or hot packs in armpits, sides of chest, and groin. Call 911 for additional rewarming instructions.
- If the worker has no pulse, cardiopulmonary resuscitation (CPR) should be provided and continued until the person responds or medical aid becomes available.

Chilblains

Chilblains are painful inflammation of small blood vessels in the skin, caused by the repeated exposure of skin to temperatures just above freezing to as high as 60°F.

What are the symptoms of Chilblains?

Redness, itching, possible blistering, inflammation, and possible ulceration in severe cases.

First Aid

- Avoid scratching.
- Slowly warm the skin.
- Use corticosteroid cream to relieve itching and swelling.
- Keep blisters and ulcers clean and covered.

Windburn

Windburn happens when your skin loses its natural oils from extreme cold, dry air. According to the Skin Cancer Foundation, the wind itself can reduce the amount of natural protection your skin has against UV rays. In turn, you may be more susceptible to the sun on a cold, windy day. Other underlying skin conditions can increase your risk of windburn. These include rosacea and eczema. If you've had a dermatologic procedure done, such as dermabrasion or a chemical peel, your skin may be extra sensitive to the wind, too. This is because such procedures remove the outer layer of your skin (epidermis).

First Aid

Treatment for windburn involves replenishing your skin's moisture while also reducing any pain. An over-the-counter pain reliever such as ibuprofen can reduce mild pain and swelling. Lukewarm water can also decrease the burn. Avoid using hot water while you're recovering from

windburn. This will strip away even more moisture from the skin and extend your recovery time.

Replenishing your skin's moisture is important in both pain relief and overall recovery. You can still wash your face and body, but make sure you do so with a creamy cleanser. Gel and water-based cleansers may be too drying for windburned skin.

Apply moisturizer throughout the day as needed while your skin recovers. If you're using a thicker lotion, you may use it up to four times per day, recommends the Marshfield Clinic. Avoid using any exfoliants, toners, and astringents until your skin completely heals.

Limit your time outdoors during the recovery process. Use a humidifier if you have one to prevent your skin from drying out even more.

Finally, make sure you drink plenty of water. Even if you don't feel overly thirsty, windburn dehydrates your skin. Drinking water is a way to replenish moisture from the inside out.

The following measures can help treat windburned lips:

- drink water
- avoid hot beverages
- avoid spicy foods
- don't pick at your lips — let any peeling skin shed on its own
- use a thick chap stick throughout the day
- apply an emollient cream or Vaseline for extra protection

Injuries Conclusion

Hypothermia occurs when body heat is lost at a rate quicker than it can be replaced. Normally, hypothermia symptoms occur when the core body temperature decreases to approximately 95 degrees Fahrenheit. Symptoms of hypothermia include shivering, stomping of the feet to

generate heat, loss of coordination, slurred speech, and skin that is pale and cold. Frostbite occurs when the skin freezes and loses water. Severe cases of frostbite may result in amputation and typically occur at temperatures less than 30 degrees Fahrenheit, but can occur at higher temperatures when wind chill is considered. Extremities such as the hands and feet are particularly vulnerable to frostbite. Symptoms of frostbite include cold, tingling, stinging, or aching followed by numbness. The affected skin will turn red, then purple, then white, and is cold to the

touch. Blistering may occur in severe cases of frostbite. Trench foot or immersion foot is caused by the foot or feet being immersed in cold water at temperatures below freezing for extended periods of time. Symptoms are similar to frostbite, but often less severe, and include tingling, itching, or burning sensations. Blisters may also form with trench foot.

Wind Chill Temperature: A Guide for Employers

Outdoor workers exposed to cold and windy conditions are at risk of cold stress, both air temperature and wind speed affect how cold they feel. Wind Chill is the term used to describe the rate of heat loss from the human body, resulting from the combined effect of low air temperature, and wind speed. The Wind Chill Temperature is a single value that takes both air temperature, and wind speed into account. For example, when the air temperature is 40°F, and the wind speed is 35mph, the wind chill temperature is 28°F; this measurement is the actual effect of the environmental cold on the exposed skin.



Wind Chill Chart

