

Manual Section 7	Issue Date 03/17/16	Revision Date 06/15/21	Policy Number LLCP-059
	Cold Stress		

Overview

Workers who are exposed to extreme cold or work in cold environments may be at risk of cold stress. Extreme cold weather is a dangerous situation that can bring on health emergencies in susceptible people, such as those without shelter, outdoor workers, and those who work in an area that is poorly insulated or without heat. What constitutes cold stress and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered factors for "cold stress." Whenever temperatures drop decidedly below normal and as wind speed increases, heat can more rapidly leave your body. These weather-related conditions may lead to serious health problems.

Scope

All LLC Companies including, Blanchard Industrial, LLC, GIS Engineering, LLC, Grand Isle Shipyard, Inc., and GWIS, Mack Steel, NuWave, Sun Industries; hereafter identified as "Company".

Types of Cold Stress

Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up your body's stored energy. The result is hypothermia, or abnormally low body temperature. A 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 it is happening and will not be able to do anything about it.

Symptoms

Symptoms of hypothermia can vary depending on how long you have been exposed to the cold temperatures.

Early Symptoms

- Shivering
- Fatigue
- Loss of coordination
- Confusion and disorientation

Late Symptoms

- No shivering
- Blue skin
- Dilated pupils
- Slowed pulse and breathing
- Loss of consciousness

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First Aid

Take the following steps to treat a worker with hypothermia:

- Alert the supervisor and request medical assistance.
- Move the victim into a warm room or shelter.
- Remove their wet clothing.
- Warm the center of their body first-chest, neck, head, and groin-using an electric blanket, if available; or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels, or sheets.
- Warm beverages may help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After their body temperature has increased, keep the victim dry and wrapped in a warm blanket, including the head and neck.
- If victim has no pulse, begin cardiopulmonary resuscitation (CPR).

Frostbite

Frostbite is an injury to the body that is caused by freezing. Frostbite causes a loss of feeling and color in the affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage body tissues, and severe cases can lead to amputation. In extremely cold temperatures, the risk of frostbite is increased in workers with reduced blood circulation and among workers who are not dressed properly.

Symptoms

Symptoms of frostbite include:

- Reduced blood flow to hands and feet (fingers or toes can freeze)
- Numbness
- Tingling or stinging
- Aching
- Bluish or pail, waxy skin

First Aid

Workers suffering from frostbite should:

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes-this increases the damage.
- Immerse the affected area in warm-not hot-water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Warm the affected area using body heat; for example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub or massage the frostbitten area; doing so may cause more damage.
- Do not use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can be easily burned.

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Trench Foot

Trench foot, also known as immersion foot, is an injury of the feet resulting from prolonged exposure to wet and cold conditions. Trench foot can occur at temperatures as high as 60 degrees F if the feet are constantly wet. Injury occurs because wet feet lose heat 25-times faster than dry feet. Therefore, to prevent heat loss, the body constricts blood vessels to shut down circulation in the feet. Skin tissue begins to die because of lack of oxygen and nutrients and due to the buildup of toxic products.

Symptoms

Symptoms of trench foot include:

- Reddening of the skin
- Numbness
- Leg cramps
- Swelling
- Tingling pain
- Blisters or ulcers
- Bleeding under the skin
- Gangrene (the foot may turn dark purple, blue, or gray)

First Aid

Workers suffering from trench foot should:

- Remove shoes/boots and wet socks.
- Dry their feet.
- Avoid walking on feet, as this may cause tissue damage.

Chilblains

Chilblains are caused by the repeated exposure of skin to temperatures just above freezing to as high as 60 degrees F. The cold exposure causes damage to the capillary beds (groups of small blood vessels) in the skin. This damage is permanent and the redness and itching will return with additional exposure. The redness and itching typically occurs on cheeks, ears, fingers, and toes.

Symptoms

Symptoms of chilblains include:

- Redness
- Itching
- Possible blistering
- Inflammation
- Possible ulceration in severe cases

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First Aid

Workers suffering from chilblains should:

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

Recommendations for workers

Workers should avoid exposure to extremely cold temperatures when possible. When cold environments or temperatures cannot be avoided, workers should follow these recommendations to protect themselves from cold stress:

- Make sure workers, especially those that work in exposed locations or elevated platforms, understand wind-chill factor. (See appendix A)
- Regularly used walkways shall be sanded salted, or cleared of snow and ice as soon as possible. Ice cleats shall be made available and shall be utilized in icy conditions.
- Make sure that workers understand the importance of high-caloric foods when working in cold environments. Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) or alcohol. (See appendix B)
- Personnel working in isolated cold environments should have backup (buddy system) and rotate out of the cold environment frequently.
- Provide hot drinks and regular breaks under extremely cold working conditions.
- Move into warm locations during work breaks; limit the amount of time outside on extremely cold days.
- Carry cold weather gear, such as extra socks, gloves, hats, jacket, blankets, a change of clothes and a thermos of hot liquid.
- Include a thermometer and chemical hot packs in your first aid kit.
- Avoid touching cold metal surfaces with bare skin.
- Monitor your physical condition and that of your coworkers.
- Regular inspections on cold weather supplies (e.g. hand warmers, jackets, shovels, etc) should be carried out to ensure that supplies are always in stock.

Select protective clothing to suit the cold, the job, and the level of physical activity:

- Protective Clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, silk and most synthetics, on the other hand, retain their insulation even when wet. The following are recommendations for working in cold environments:
 - Wear at least three layers of clothing. An inner layer of wool, silk or synthetic to wick moisture away from the body.

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A middle layer of wool or synthetic to provide insulation even when wet. An outer wind and rain protection layer that allows some ventilation to prevent overheating.

- Wear a hat or hood. Up to 40% of body heat can be lost when the head is left exposed.
- Wear insulated boots or other footwear. Tight-fitting footwear restricts blood flow. Footwear should be large enough to allow wearing either one thick or two thin pairs of socks. Wearing too many socks can tighten fit and harm rather than help.
- Keep a change of dry clothing available in case work clothes become wet.
- With the exception of the wicking layer do not wear tight clothing. Loose clothing allows better ventilation of heat away from the body.
- Do not underestimate the wetting effects of perspiration. Oftentimes wicking and venting of the body's sweat and heat are more important than protecting from rain or snow.
- Workers in areas that require fire-retardant clothing (FRC) should make sure that the outer layer is fire retardant.
- All cold weather clothing should allow concurrent use of required PPE such as a hard hat. FRC, balaclavas (ski masks) or other face covers may also be necessary under certain conditions.

Manual dexterity is essential to safety and production. When fine work is to be performed in cold environments, hands should be kept warm with equipment. For example: warm air jets, radiant heaters (fuel burning or electric), contact warming plates, etc. Personnel using this equipment must adhere to Hot Work guidelines.

Metal handles of tools and control bars should be covered by thermal insulating material or employees should wear gloves to prevent skin to metal contact for temperatures below 30.2°F (-1°C). Tools and machine controls to be used in cold conditions should be designed for operation by gloved hands.

Training

Employees shall receive initial and annual training on this program. Contents shall include but are not limited to, health effects of cold exposure, proper rewarming procedures, recognition and first aid for frostbite and hypothermia, required protective clothing, proper use of warming shelters, the buddy system, vehicle breakdown procedures, and proper eating and drinking habits for working in the cold.

In addition, employees required to work in cold conditions shall be knowledgeable on how to administer first aid treatment on cold induced injuries or illnesses.

Employees will also be informed of the dangers caused by unstable snow buildup, sharp icicles, and ice dams and know how to prevent accidents caused by them.

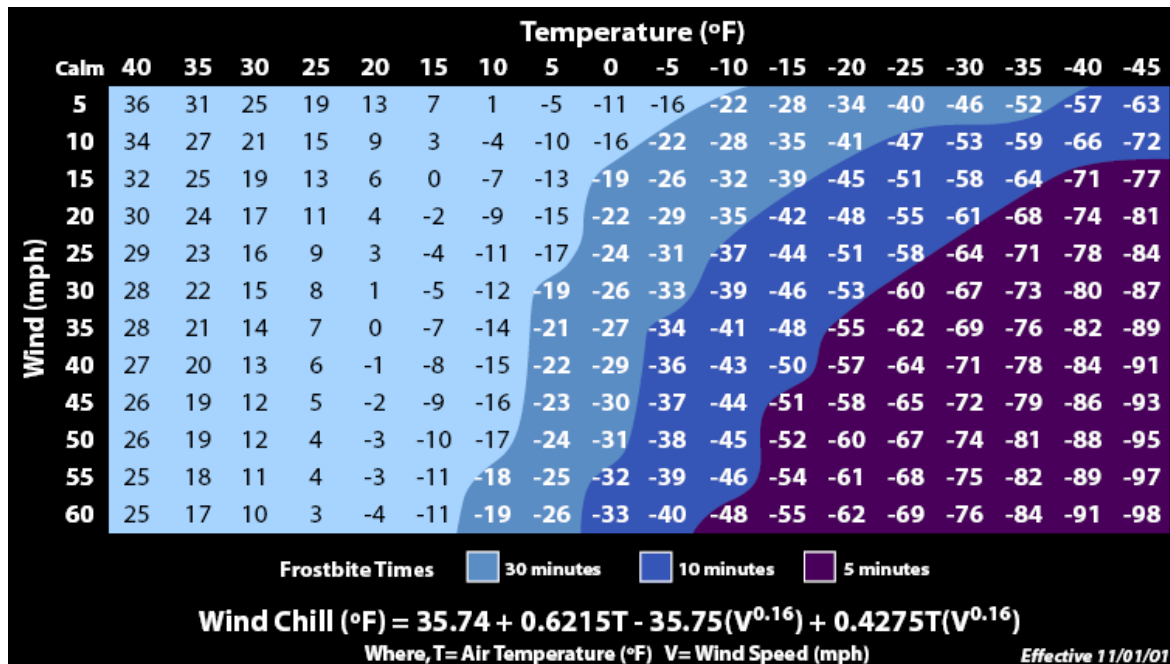
Appendix A

Wind Chill Factor

Wind chill (often popularly called the wind chill factor) is the felt air temperature on exposed skin due to wind. It measures the effect of wind on air temperature. The wind chill temperature is usually lower than the air temperature, since the air temperature is usually lower than the human body temperature.

The chart set forth shall be used as a “Guide” ONLY. Individuals will all act differently in in-climate weather. Many factors influence how an individual acclimates to the weather. Some of these influences are as follows:

- Age
- Weight
- Degree of physical fitness
- Degree of acclimatization
- Metabolism
- Use of alcohol, drugs or diuretic products such as caffeine, ginseng, etc.
- Medical Conditions such as hypertension, diabetes, etc.



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Appendix B

High Caloric Foods

The energy density of foods is determined by the foods' calories and weight. High energy foods contain more calories per gram in weight than low energy density foods. According to the Centers for Disease Control and Prevention, replacing higher energy density foods with lower energy density alternatives can play an important role in weight management. Eat warm, high-calorie foods such as hot pasta dishes