

# Safety Talk: Working in Cold Weather

## Know the signs of cold stress, and how to respond

### Hypothermia

A decrease in the core body temperature to a level at which normal muscular and cerebral functions are impaired. This process begins when the core body temperature drops below 36°C (96.8°F)

The quiet symptoms of potentially fatal cold-related disorders, including hypothermia, often go undetected until the worker's health is endangered.

### Frostbite

Two factors, the external temperature and the body's blood flow, affect tissue temperature in cold weather. All cold-related injuries are inherently affected by the dynamics of blood flow in the peripheral regions of the body. As peripheral circulation is reduced to prevent heat loss to the body core, cold-related injuries are more likely to occur.

### Assessing the Risk

A cold stress risk assessment will be completed when outdoor or workplace environments may put workers at risk of hypothermia or cold-related injuries. Outdoor and workplace conditions that may alert the production to conduct a cold stress risk assessment are:

- Temperature: Hypothermia can develop at 10°C or less
- Sweating/Precipitation at 10°C or less: Sweating, rain or snow will make a worker's clothing wet, and this increases a workers' rate of cooling
- Wind at 10°C or less: Increasing wind speed increases a workers' rate of cooling
- Cold Equipment: Workers working with refrigeration equipment or ice surfaces may be at risk
- Personal Factors: Workers' health status may influence their capacity to withstand cold environments

There are risk factors that will increase the degree of cold stress and likelihood of hypothermia, including:

- Poor physical fitness
- Not being used to working in the cold
- Having a cold or other flu like symptoms
- Chronic illness, especially heart disease, asthma/bronchitis, diabetes mellitus or chronic circulatory problems
- Using certain drugs or medication such as alcohol, nicotine, caffeine and medication that inhibit the body's response to the cold or impairs judgement
- Exhibiting symptoms of fatigue
- Vibration/white finger disease (also known as Raynaud's Disease or Raynaud's Phenomenon)

### Proper Use of Clothing

There are regulatory requirements to wear protective clothing for protection from the risk of exposure to cold-related disorders. You are encouraged to wear several layers of clothing rather than one thick layer. Air captured between layers acts as an insulator, affording better heat conservation.

When working outdoors where there is the risk of exposure to hypothermia and cold-related injury, you are encouraged to wear adequate layers of clothing for optimal protection against the natural elements. These layers include:

### **Underlayer**

This is the layer closest to the skin. Ideally this layer should consist of clothing made of a material that wicks moisture away from the body (such as polypropylene). Cotton is a poor choice for this layer as cotton tends to absorb and hold moisture, which can cause the body to lose heat.

### **Insulating Layer**

This next layer serves to insulate the body and conserve body heat. There are many new materials available for use as an insulating layer, but the old standbys are wool and fleece. Wool is an excellent insulator and can conserve heat even when it is wet. A light weight wool sweater serves well as the insulating layer for the upper body.

### **Outer Layer**

This final layer provides a barrier to wind and moisture, as well as helping to conserve body heat. The best material for the outer shell is a breathable, water-resistant material.

## **Hypothermia and Use of Shelters**

If the Equivalent Chill Temperature is  $-7^{\circ}\text{C}$  ( $19^{\circ}\text{F}$ ) or below, production will ensure that a heated shelter is located near the work area. You are encouraged to use these shelters at regular intervals depending on the equivalent chill temperature. A heated vehicle is acceptable as a heated shelter.

Workers entering the shelter you should remove your outer layer of clothing and loosen other clothing to let sweat evaporate. In some cases, a change of clothing may be necessary.

Workers exhibiting signs and symptoms of hypothermia or cold-related injuries need to be evaluated by a First Aid Attendant.

## **Guidelines for Eating and Drinking**

High-caloric foods are important when working in cold environments. Food items such as warm, sweet drinks and soups help to maintain caloric intake and fluid volume. It is important to maintain an adequate fluid balance, as working in cold environments can result in excessive sweating. Coffee should be discouraged because it increases water loss and blood flow to body extremities.

## **Safe Work Practices**

- Employ a “buddy system” to keep a regular watch on each other, including faces, cheeks, and ears for signs of frostnip, frostbite and behavior for indications of impending hypothermia.
- Keep a regular “self-check” for cold areas, wet feet, numbness or loss of sensation.
- If, at any time, you discover a cold-related injury, stop work and re-warm the area of the injury.

## Working in Cold Weather: Appendix A

Stages of Hypothermia		
Stage	Core Temperature	Signs and Symptoms
<b>Mild Hypothermia</b>	36°C-35°C (96.8°F-95°F)	<ul style="list-style-type: none"> <li>• Feel chilled/cold sensation</li> <li>• Goose bumps</li> <li>• Unable to perform complex tasks with hands</li> <li>• Poor judgement, muddled thinking and abnormal behavior</li> <li>• Bouts of Shivering</li> <li>• Hands may be numb</li> </ul>
<b>Moderate Hypothermia</b>	35°C-32.2°C (95°-90°F)	<ul style="list-style-type: none"> <li>• Violent shivering or shivering has stopped altogether</li> <li>• Inability to think and pay attention (e.g. victim cannot understand what is being said)</li> <li>• Mild confusion although may appear alert</li> <li>• Slow, shallow breathing</li> <li>• Slurred speech</li> <li>• Poor body co-ordination (e.g. stumbling gait)</li> <li>• Slow, weak pulse</li> </ul>
<b>Severe Hypothermia</b>	< 32.2°C (< 90°F)	<ul style="list-style-type: none"> <li>• Shivering has stopped</li> <li>• Unconsciousness</li> <li>• Little or no breathing</li> <li>• Weak, irregular or non-existent pulse</li> <li>• Dilated (wide open) pupils</li> <li>• Exposed skin blue and/or puffy</li> <li>• Possible similarity of symptoms to clinical definition of death</li> </ul>

### General Tips for Handling Hypothermic Victims:

- **Remove the victim from the cold environment and assess by a First Aid Attendant or by a physician, as soon as possible**
- Always handle the victim gently. Rough handling can cause heartbeat irregularities and death

- Hot fluids may be given only if the victim is fully alert, without any signs of confusion. Victims with moderate and severe hypothermia have a high risk of vomiting and must not be given anything by mouth
- Do not attempt to exercise victims. Take immediate measures to prevent further heat loss and continue to do so even if victim regains consciousness
- Remember that the victim may still be alive even if there is little or no pulse or heart beat