Assessing Cold Stress

This program outlines the U of A best practice for assessing the daily risk of cold stress.

Introduction and Scope

Assessing cold stress risk can be complicated. This document outlines a method that can be used on a day-to-day basis to assess the risk to employees. While typically designed for outdoor work, it can be used for indoor work as well. For permanent work areas that have low temperatures, please contact EHS at ehs.info@ualberta.ca for assistance.

Hazard Identification

A cold stress assessment should be completed if:

1. Employee monitoring should begin when the temperature drops below -12 °C.
2. A work-warm up-schedule should be used when the air temperature drops below -25 °C or the wind chill factor ("feels like" temperature) drops below -27 °C.
3. Environment Canada or other governmental agency has released a cold advisory or warning.
4. Working in a low temperature environment such as freezer.

Hazard Assessment

Conduct a hazard assessment for cold stress prior to work and at regular intervals as conditions change throughout the day. To determine the risk of cold stress on employees, supervisors must look at the Air Temperature, Wind Chill, or "Feels Like" temperature.

Determining Wind Chill Temperatures

Look up the air temperature and wind speed and refer to the Environment Canada Wind Chill Chart to determine the risk category. See Table 1 and 2 for details.

Table 1: Cold-Stress Risk Levels

Monitor	The risk of cold stress is low but employees should be monitored and any signs or symptoms of cold stress should be handled appropriately. Appropriate clothing should be worn.
Controls Required	The risk of cold stress is moderate and controls are required. This may include temporary shelters, wind breaks, a work-warmup schedule, rescheduling of work to warmer periods and layering clothing.
Controls Required	The risk of cold stress is high and controls are required. This may include rescheduling work, mandatory shelters, longer warmup breaks and additional layers of clothing.
Cease Work	The risk of cold stress is very high and all non-emergency work should be ceased and rescheduled. Workers may be reassigned to other tasks until conditions improve. Emergency work must include any controls practical and workers must be monitored for signs and symptoms of cold-related conditions.

Table 2: Work-Warm Up Schedule

Air Temp - Sunny Sky	No Noticeable Wind		8 km/h (5 mph) Wind		16 km/h (10 mph) Wind		24 km/h (15 mph) Wind		32 km/h (20 mph) Wind	
~°C	Max Work Period (min)	# of Breaks	Max Work Period (min)	# of Breaks	Max Work Period (min)	# of Breaks	Max Work Period (min)	# of Breaks	Max Work Period (min)	# of Breaks
-26 to -28	Normal Breaks (1)		Normal Breaks (1)		75	2	55	3	40	4
-29 to -31	Normal Breaks (1)		75	2	55	3	40	4	30	5
-32 to -34	75	2	55	3	40	4	30	5	Non-Emergency Work should cease	
-35 to -37	55	3	40	4	30	5	Non-Emergency Work should cease			
-38 to -39	40	4	30	5	Non-Emergency Work should cease					
-40 to -42	30	5	Non-Emergency Work should cease							
< -43	Non-Emergency Work should cease									

Note: Schedule applies to a 4-hour work period with moderate to heavy work activity. Warm up breaks must be a minimum of 10-minutes with an extended break (lunch) at the end of the 4-hour period. All breaks must be provided in a warm location. Adapted from the AB OHS - Best Practice, Working in the Heat and Cold.

Table 3: Estimating Wind Speed

Km/Hour	Km/h / Mph	What to Look For
8	8 / 5	moves a light flag, leaves rustle
16	16 / 10	fully extends a light flag, leaves constantly moving
24	24 / 15	raises dust, leaves or a newspaper sheet
32	32 / 20	blowing and drifting snow, small branches move