

Working in Winter Weather

The onset of winter it is a good time to take a look at your municipal department's preparations for working in colder weather. Prolonged exposure to freezing or cold temperatures may cause serious health problems such as trench foot, frostbite and hypothermia. In extreme cases, including cold water immersion, exposure could lead to death.¹ Municipal employees and volunteers including, firefighters, EMS workers, police officers, road crews and sewerage staff could spend prolonged periods in weather extremes and it's important to take proactive steps to stay safe while completing assigned tasks.

Our bodies develop heat from food and muscular activity and lose it through convection, conduction, radiation and sweating to try and maintain a constant body temperature. When body temperature drops even a few degrees below its normal temperature of 98.6°F (37°C), the blood vessels constrict, decreasing peripheral blood flow to reduce heat loss from the surface of the skin. Shivering is an outward sign of the body's attempts to generate heat by increasing the body's metabolic rate.

There are four environmental conditions that often cause cold-related stress: low temperatures, high/cool winds, dampness and cold water. Wind chill, a combination of temperature and relative wind velocity, is a crucial factor to evaluate when working outside. For example, a police officer directing traffic could get frostbite within 30 minutes when working in 30 mph winds and 5 °F. A dangerous situation of rapid heat loss may arise for any individual exposed to high winds and cold temperatures.



Wind Chill Chart



		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times: 30 minutes 10 minutes 5 minutes

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

Major Risk Factors for Cold-Related Stresses

- Wearing inadequate or wet clothing can increase the effects of cold on the body.
- Taking certain drugs or medications such as alcohol, nicotine, caffeine and medication that inhibits the body's response to the cold or impairs judgment.
- Having a cold or certain diseases, such as diabetes, heart, vascular and thyroid problems, may make a person more susceptible to the winter elements.
- Becoming exhausted or immobilized, especially due to injury or entrapment, could speed up the effects of cold weather.
- Aging -- the elderly are likely more vulnerable to the effects of harsh winter weather.

This is a sample guideline furnished to you by Glatfelter Brokerage Services, Group Manager. Your organization should review and make the necessary modifications to meet the needs of your organization. The intent of this guideline is to assist you in reducing risk exposure to the public, personnel and property. www.GlatfelterPublicPractice.com

Danger signs² – If these signs are observed, call for emergency help.

- Uncontrolled shivering
- Slurred speech
- Clumsy movements
- Fatigue
- Confused behavior

Help Protect Workers

- Recognize the environmental and workplace conditions that may be dangerous.
- Learn the signs and symptoms of cold-induced illnesses and injuries and what to do to help workers.
- Train workers about cold-induced illnesses and injuries.
- Encourage workers to wear proper clothing for cold, wet and windy conditions, including layers that can be adjusted to changing conditions.
- Pay special attention to protecting feet, hands, face and head. Up to 40 percent of body heat can be lost when the head is exposed.
- Insulate footwear to protect against cold and dampness.
- Keep a change of clothing available in case work garments become wet.
- Take a frequent short break in warm dry shelters to allow body temperature to increase when working in extreme conditions.
- If not an emergency situation, try to schedule work for the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system - work in pairs so that one worker can recognize danger signs.
- Remain hydrated.
- Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) or alcohol.
- Eat warm, high-calorie foods such as hot pasta dishes.
- Remember, workers face increased risks when they take certain medications, are in poor physical condition or suffer from illnesses such as diabetes, hypertension or cardiovascular disease.

Police, firefighters, EMS, road crews and sewerage workers are just some of the employees or volunteers that may work in cold and damp environments from time to time to support school activities. Knowing the facts about how cold exposure can affect the body and following a few simple guidelines could help make the winter season a safe and healthy one.

References:

1. *Occupational Safety & Health Administration (OSHA): Protecting Workers in Cold Environments, 1998.*
2. *CDC: Extreme Cold - A Prevention Guide to Promote Your Personal Health and Safety*