

Health and Safety Data

Wind Chill Chart

WIND SPEED IN MPH	Equivalent Wind Chill Temperatures at Actual Temperature Readings (°F)									
	50	40	30	20	10	0	-10	-20	-30	-40
calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-40
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	20	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	LITTLE DANGER (for properly clothed person)			INCREASING DANGER			GREAT DANGER			
				(Danger from freezing of exposed flesh)						

Hypothermia

Mild:

- Symptoms:** Shivering, loss of coordination, complains of being cold.
- Treatment:**
 - Move victim to someplace warm and dry. Add more clothing, or replace wet clothing with dry.
 - Cover the person's head and/or neck. Put a barrier between the person and the ground.
 - Cover the person with a space blanket or other vapor barrier. Offer warm nonalcoholic liquids or food.
 - Encourage the person to move around to generate more heat.
 - Apply heat packs to head, neck, underarms, sides of chest, or groin; insulate heavily to prevent further heat loss. Warm shower or bath if available and victim is alert.
 - As a last resort, have someone who is NOT hypothermic get into a sleeping bag with the victim. This method may endanger the rescuer. Two people who are hypothermic should not do this.

Moderate:

- Symptoms:** Listless, confused, does not recognize problem; shivers uncontrollably, uncoordinated, speech slurred.
- First Aid:** Same treatment as above, but cover the person rather than moving him. Do not allow victim to exercise or move, treat very gently. Check for other injuries including frostbite.

Severe:

- Symptoms:** Internal temperature of 90°F (32.2°C) or less. Unconsciousness, slow pulse and respiration, no shivering, physical collapse, unresponsive to pain or words.
- First Aid: Life-threatening - call for professional care.**
If pulse and respiration are present, treat as above, but don't give oral fluids unless completely conscious. Do not put the person in a warm shower or bath, and be careful to handle the person gently. Do not rub hands or feet.
- If pulse and respiration are not present, take the above measures to rewarm the person, start CPR, and get to a medical facility ASAP.

Heat – Humidity Factor

Rel. Hum. %	Air Temperature (°F)										
	70	75	80	85	90	95	100	105	110	115	120
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	130
30%	67	73	78	84	90	96	104	113	123	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	107	120	135	150		
60%	70	76	82	90	100	114	132	149			
70%	70	77	85	93	106	124	144				
80%	71	78	86	97	113	136					
90%	71	79	88	102	122						
100%	72	80	91	108							

WARNING: The light grey shaded area above identifies the "danger zones" where the Heat/Humidity index is 90 or above.

Heat/Humidity Index Danger Zones

- 90° - 104° Heat cramps or heat exhaustion possible
- 105° - 130° Heat cramps or heat exhaustion likely, heatstroke possible
- 130° - more Heat stroke highly likely

Heat Emergencies

Heat Cramps

- **Symptoms:** Heavy exertions results in muscle pain and spasms, usually in leg or abdominal muscles.
- **Treatment:** Get victim to a cool place and give him one-half glass of cool water every 15 minutes.

Heat Exhaustion

- **Symptoms:** Cool, pale, moist skin, heavy sweating, dilated pupils, headaches, nausea, dizziness & vomiting. Body temperature appears to be near normal.
- **Treatment:** Move victim to a cool place. Have victim lie on back with feet elevated. Remove or loosen clothing. Apply cold packs, wet towels or sheets, or fan the victim if these are not available. Give water every 15 minutes, if the victim is conscious.

Heat Stroke is Life threatening – begin to cool the victim and call for medical help immediately!

- **Symptoms:** Sweat glands shut down – no perspiration. Hot, dry, red skin. Pupils contracted very small. Body temperature very high, even up to 105°. Victim may refuse water, vomit or lose consciousness.
- **Treatment:** ACT IMMEDIATELY! Cool the victim as soon as possible in any way you can. Place in a bathtub of cool water, wrap in wet sheets, or put in an air conditioned room. Do not wait for help to arrive! Treat for shock, and do not give anything by mouth.

Sound Intensities

Sound intensities are typically measured in decibels (db). A decibel is defined as 10 times the logarithm of the power ratio (power ratio is the ratio of the intensity of the sound to the intensity of an arbitrary standard point). Normally a change of 1 db is the smallest volume change detectable by the human ear.

Sound intensity is also defined in terms of energy (erg) transmitted per second over a 1 square centimeter surface. This energy is proportional to the velocity of propagation of the sound. The energy density is $erg/cm^2 = 2\pi^2 \times$ density in $g/cm^3 \times$ frequency² in Hz \times amplitude² in cm.

Decibels	Degree	Loudness or Feeling
225	Deafening	12" cannon @ 12 ft. in front below
194		Saturn rocket, 50# of TNT @ 10'
140		Artillery fire, jet aircraft, ram jet
130		Threshold of pain: >130 causes immediate ear damage
		Propeller aircraft at 5 meters, hydraulic press, pneumatic rock drill
120		Thunder, diesel engine room, nearby riveter
110		Close to a train, ball mill
100	Very Loud	Boiler factory, home lawn mower, car horn at 5 meters, wood saw
90		Symphony or a band
		>90 regularly can cause ear damage
		Noisy factory, truck without a muffler
80	Loud	Inside a high speed auto, police whistle, electric shaver, noisy office, alarm clock
70		Average radio, normal street noise
60	Moderate	Normal conversation close up
50		Normal office, quiet stream
45		To awaken a sleeping person
40	Faint	Normal private office noise, residential neighborhood, no cars
30		Quiet conversation, recording studio
20	Very Faint	Inside an empty theater, ticking of watch, rustle of leaves, whisper
10		Sound proof room, Threshold of hearing
0		Absolute silence

Permissible Noise Exposures

Hours Duration per Day	Sound Level in Decibels (Slow Response)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

The above restrictions are based on the Occupational Safety and Health Act of 1970. That Code basically states that if the above exposures are exceeded, then hearing protection must be worn. Note that these are based on the "A scale" of a standard sound level meter at slow response and will change if some other standard is used. See the OSHA Section 1910.95 for additional details on the differences.