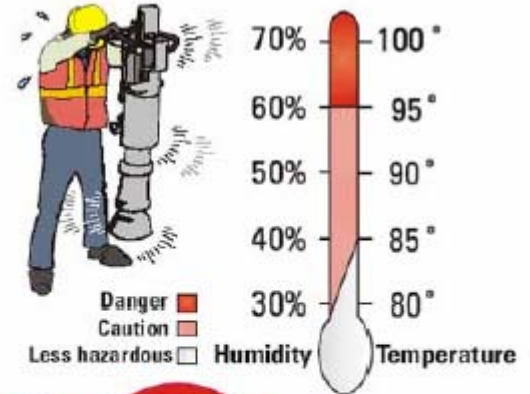


Heat Stress July 22, 2008:

Although the numbers vary widely from year to year, on average, over 300 people in North America die each year from heat related illnesses. When the body can no longer adequately cool itself by sweating, heat exhaustion and the much more serious heat stroke can occur and can result in death. Under normal conditions the body's ability to dissipate heat through the evaporation of sweat and convection of cooler air over the skin is sufficient to prevent heat-related conditions from developing.

As temperature and humidity rise, the effectiveness of the primary method of cooling by evaporation is reduced. Another important factor for heat-related health problems is insufficient intake of fluids (water and electrolyte solutions) during these conditions. Prolonged exposure to high temperature and humidity, direct sun or heat, limited air movement, physical exertion, some medications and poor physical condition can lead to serious heat related conditions.



Prevention of heat related illnesses

- Maintain hydration with cool water and sports drinks;
 - At least 8 glasses of water a day, more in hot weather (extra fluids at meal times).
 - Avoid caffeinated beverages and alcohol (both increase fluid loss).
- Maintain ventilation of environment, including buildings and confined spaces, and keep it as cool as possible
- Use fans and air movers in high heated areas.
- Take frequent breaks when outside in hot sun or from physical activity.
- Know the limits of activity tolerance and avoid overexertion.
- Refer to and follow the [Humidex Based Heat Response Plan](#).
- Schedule activities for cool environments or during the cooler part of the day.
- Eat regular light meals to ensure you have adequate salt and fluids.
- Be aware of individuals with risk factors for heat related illness; observe them at regular intervals.



Symptoms of Heat Exhaustion:

- Fatigue, thirst and heavy sweating.
- Headache, dizziness, lightheadedness or fainting.
- Cramps, nausea and vomiting.

What to do:

- Move the person out of the heat to a cool place to rest. Loosen or remove outer layer of clothing.
- Raise the legs 8 to 12 inches and give them a sports drink or water. **NO CAFFEINATED OR ALCOHOLIC DRINKS!**
- Cool the person with cold, wet cloths to the forehead and body.

Symptoms of Heat Stroke:

- Dry, hot skin with no sweating.
- Fast breathing, headache, dizziness and confusion.
- Irrational behavior, convulsions and loss of consciousness.

What to do for Heatstroke:

- **CALL 911 IMMEDIATELY!** After removing outer clothing, cool the person as quickly as possible by spraying or sponging with cold water and applying ice bags or cold packs to the neck, armpits and groin. Do not give liquids if nauseous or vomiting.

Humidex Based Heat Response Plan

What is the Humidex Based Response Plan?

- The Humidex plan is a simplified way of protecting workers from heat stress which is based on the ACGIH Heat Stress TLV (as per Nexen's Health, Safety, Environment & Social Responsibility Requirements).

NOTE: The attached tables are based on moderate, un-acclimatized work, with little or no radiant heat, assuming wearing regular summer clothing; if your conditions vary from these, see the steps listed below (steps 1 – 5) to make adjustments.

Humidex	Response
25-29°C	supply water to workers on an "as needed" basis
30-33°C	post Heat Stress Alert notice; encourage workers to drink extra water; start recording hourly temperature and relative humidity
34-37°C	post Heat Stress Warning notice; notify workers that they need to drink extra water; ensure workers are trained to recognize symptoms
38-39°C	provide 15 minutes relief per hour; provide adequate cool (10-15°C) water; at least 1 cup (240 mL) of water every 20 minutes workers with symptoms should seek medical attention
40-42°C	provide 30 minutes relief per hour in addition to the provisions listed previously;
43-44°C	if feasible provide 45 minutes relief per hour in addition to the provisions listed above. if a 75% relief period is not feasible then stop work until the Humidex is 42°C or less;
45°C or over	stop work until the Humidex is 44°C or less

Fans:

Fans provide air movement which can increase the rate at which sweat evaporates (thus cooling the body). However, when relative humidity levels rise above 70%, very little evaporation occurs and increasing air movement has little benefit. If the air is the same temperature as the skin (36°C) or higher, moving air may actually heat up the body especially if the humidity is high.

Vulnerability to Heat Stress:

There are many permanent or temporary conditions (e.g. age, heart or lung conditions, dehydration, fatigue, some medications, etc.) that can make a person more vulnerable to heat stress. Despite their condition, they may be able to cope given adequate knowledge of the signs and symptoms of heat stress and if given the latitude to make the appropriate adjustments to their workplace or work routine. It is more often the young, fit workers who may think they are invincible who succumb to heat stress. Some workers may need medical advice about what accommodations would be right for them.

Humidex Heat Stress Response Plan

Temp (in °C)	Relative Humidity (RH) (in %)																		Temp (in °C)		
	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%		10%	
49																			50	49	
48																			49	48	
47																		50	47	47	
46																		49	46	46	
45	NEVER IGNORE ANYONE'S SYMPTOMS DESPITE YOUR MEASUREMENTS!!!																		45		
44	Humidex	Action																49	46	43	44
43	45+	stop work															49	47	45	42	43
42	43-44	45 min/hr relief														50	48	46	43	41	42
41	40-42	30 min/hr relief														48	46	44	42	40	41
40	38-39	15 min/hr relief													49	47	45	43	41	39	40
39	34-37	warning & more water												49	47	45	43	41	39	37	39
38	30-33	alert & water										49	47	45	43	42	40	38	36	38	38
37	25-29	water as needed									49	47	45	44	42	40	38	37	35	37	37
36									50	49	47	45	44	42	40	39	37	35	34	36	36
35								50	48	47	45	43	42	40	39	37	36	34	33	35	35
34							49	48	46	45	43	42	40	39	37	36	34	33	31	34	34
33				50	48	47	46	44	43	41	40	39	37	36	34	33	32	30	29	33	33
32		50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	28	32	32
31	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	32	30	29	28	31	31
30	48	47	46	44	43	42	41	40	39	37	36	35	34	33	31	30	29	28	27	30	30
29	46	45	43	42	41	40	39	38	37	36	35	33	32	31	30	29	28	27	26	29	29
28	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	28	28
27	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25			27	27
26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25				26	26
25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25					25	25
24	35	34	33	33	32	31	30	29	28	28	27	26	25							24	24
23	33	32	31	31	30	29	28	28	27	26	25									23	23
22	31	30	30	29	28	27	27	26	25	25										22	22
21	29	29	28	27	26	26	25													21	21

Humidex Based Heat Response Plan

Step #1: Clothing

- Evaporating sweat is the primary way the body gets rid of excess heat build-up, therefore, the best clothing is the kind that makes it easiest for sweat to evaporate.
- The Humidex plan assumes workers are wearing regular summer clothes (light shirt & pants, underwear and socks and shoes).
- For workers who wear cotton overalls on top of summer clothes one should add 5°C Humidex to the workplace Humidex measurement.
- For different clothing configurations, estimate correction factor by comparing them with cotton overalls (e.g. gloves, hard hat, apron, protective sleeves might be equivalent to a little less than half the evaporation resistance as overalls so add 1°C or 2°C Humidex).

Step #2: Training

- The Humidex plan by itself cannot guarantee that workers will not be affected by heat stress. It is absolutely essential that workers learn to recognize the early signs and symptoms of heat stress and know what to do to prevent them!
- If at all possible, workers need to be able to alter their pace of work, rest breaks, and fluid intake in response to early symptoms (240 mL every 20 minutes).
- The ideal heat stress response plan would let workers regulate their own pace by "listening to their body" without need for measurements.

Step #3: Select a Measurement Location

- Split the workplace into heat stress zones and put a thermal hygrometer in each zone.
- Identify a representative location within the zone where measurements can be taken (if you want to base your actions on a single reading, select the highest heat stress zone).

Note: the Humidex Heat Stress Response Plan is **based on workplace measurements not weather station/media reports** (temperatures inside buildings/confined spaces/work area do not necessarily correspond with outside temperatures).

Step #4: Measure Workplace Humidex

- A thermal hygrometer is a simple way to measure the temperature and relative humidity in your workplace
- Once you have the temperature and humidity, use the table above to determine the corresponding Humidex value and the appropriate heat stress prevention response.
- Measurements should be recorded at least hourly if the Humidex is above 30°C.

NEVER IGNORE ANYONE'S SYMPTOMS NO MATTER WHAT THE HUMIDEX!

Step #5: Adjusting for Radiant Heat

- For outdoor work in direct sunlight between the hours of 10 am and 4 pm, add 2-3°C to your Humidex measurement
- For indoor radiant heat exposures, use common sense to judge whether the exposure of concern involves more or less radiant heat than direct sunlight and adjust the 2-3°C correction factor appropriately

Environment Canada Humidex Calculator can be located at the following web site:

http://lavoieverte.qc.ec.gc.ca/meteo/Documentation/Humidex_e.html

Alberta Work Place Health & Safety Bulletin on *Working In The Heat* (MG022) can be located at the following web site: <http://industry.alberta.ca/whs-ohs>

Please do not hesitate contacting me if you have any questions or concerns with this safety alert or any other health & safety issue.

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Safety. It's not just talk!

