



Working in Hot Weather or Hot Workplace Environments

Subject: Procedures and Guidelines for Working in Hot Environments

Applies to: All employees

Number: 2010-06

Pages: 7

Effective Date: November 2010

Supersedes: June 2010

Prepared and Approved by: Occupational Health and Safety

PURPOSE:

This work procedure is intended to prevent potential heat induced illness as a result of hot weather or hot workplace environments.

DEFINITIONS:

Acclimatization: Physiological changes which occur in response to several days of heat exposure and make the body accustomed to a hot environment.

ACGIH - American Conference of Governmental Industrial Hygienists

Heat stress – The sum of environmental and metabolic heat loads on the individual. Includes heat exhaustion, heat stroke, heat rash, heat cramps and fainting.

Hot environment – Conditions that challenge the human body by subjecting it to the single or combined effects of air temperature, sunshine, wind speed, humidity and duration of exposure.

Humidex – An index from Environmental Canada that combines the effects of temperature and humidity to quantify human discomfort due to perceived heat.

Relative humidity – The moisture content of air expressed as a percentage of the maximum it can hold at a given temperature, (% RH). Optimum relative humidity for comfort is between 30% and 60%.

Temperature – Expressed in degrees Celsius (°C) or degrees Fahrenheit (°F). The optimum temperature for comfort is 22 to 24 °C. Temperature preferences can vary among individuals.

APPLICATION:

This procedure applies to any worker who may work in hot weather or hot workplace environments. The following parameters will serve as triggers to implement this procedure:

- When the Humidex reaches or exceeds 35, or
- When air temperature reaches 32 °C or higher.

These parameters will also serve as indicators that measurements of workplace temperatures and Humidex are to be determined every 30 minutes to aid in administering proper controls.

RESPONSIBILITIES:

All University employees who are required to perform work in hot environments must be familiar with and comply with this work procedure. Supervisors must ensure proper work practices, administrative and engineering controls and applicable measures in this work procedure are implemented for the protection of workers.

TRAINING REQUIRED:

Supervisors must ensure that workers are provided with training. Worker will be able to:

1. Recognize causes, signs and symptoms of heat stress and heat induced illness (sunburn, contact burns, fatigue, distraction, etc.)
2. Identify factors that increase the risk of heat induced illness including medications, medical conditions etc.
3. Understand controls and preventative measures of heat induced illness.
4. Identify first aid response and procedure for getting medical attention for heat induced illness.

Refresher training should happen annually. The training will be offered by Occupational Health and Safety in the spring of each year.

PROCEDURE:

1. As a practical applied process, the supervisor must adhere to the following procedure when assigning work, to determine what controls need to be implemented and communicated with worker(s):

- a) Use a regular thermometer and an accurate humidity meter
- b) Measure the actual air temperature and humidity in the intended work area
- c) Refer to Environment Canada Humidex Chart (Table 1) to determine the Humidex level

d) Classify the work:

Examples

Rest	Sitting (quietly or with moderate arm movement)
Light Work	Sitting or standing to control machines, performing light hand or arm work (eg. Using a table saw); occasionally walking; driving
Moderate Work	Walking about with moderate lifting and pushing or pulling; walking at moderate pace; eg. Scrubbing in a standing position.
Heavy Work	Pick and shovel work; digging; carrying; pushing/pulling heavy loads; walking at fast pace; eg. Carpenter sawing by hand.
Very Heavy Work	Very intense activity at fast to maximum pace; eg. Shoveling wet sand

e) Based on the determined Humidex Level and the work classification, administer controls as outlined in Table 2.

f) Enter all readings in the “Field Temperature and Humidity Measurements” form (attached).

Upon completion of the work, the supervisor of the work will be responsible for submitting the Form to the Facilities Safety Coordinator, OHS, for filing for a minimum period of two years.

g) Clothing and Personal Protective Equipment:

Personal Protective Equipment must be worn as required by the task being performed. If possible, workers should wear light clothing that allows air to move freely and sweat to evaporate. For workers who wear cotton overalls on top of summer clothes, add 5 °C Humidex to the workplace Humidex measurement. For different clothing configurations, estimate correction factor by comparing them to cotton overalls (eg. 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)

If a hard hat is not required, the worker should wear a light coloured hat preferably with a big rim to provide maximum shading. Sunglasses with a UVA and UVB protection should be worn as well as sunscreen with a sun protection factor (SPF) of at least 30 which should be applied regularly. If applicable, appropriate apparel to prevent burns from hot conductive or radiant materials should be worn.

2. Work in hot environments should not be conducted alone. A buddy system should be used to monitor symptoms of heat related illness and ensure adherence to the program (i.e. taking water breaks).

3. Jobs requiring heavy work should be scheduled at cooler times of the day.

4. In situations such as heat waves (3 or more days of temperatures of 32 °C or more) where the worker will be working continuously in a hot environment, supervisors are responsible for ensuring their workers are acclimatized based on the following criteria:

- If the worker is experienced on the job, their time in hot environments must be limited to 50% of the shift on the first day, 60% of the shift on the second day and 80% of the shift on the third day. On the fourth day a full shift can be worked.
- If the worker is not experienced on the job they should spend 20% of their time working in hot conditions on the first day and increase their time by 20% each subsequent day.

5. When applicable, reduction of physical demands of work tasks should be done through mechanical assistance where possible (hoist, carts, etc.).

6. Workers will be provided with water or other fluids and be reminded to drink a cup approximately every 20 minutes.

7. Workers should take more frequent and longer breaks if possible in shaded and cooler areas.

8. Workers with heat stress symptoms will receive first aid care and referred to Workplace Health if necessary based on symptoms and severity of their heat stress.

To review the WSIB Heat Stress Awareness Guide, please click on this link:

<http://www.wsib.on.ca/files/Content/PreventionHSGuide/HeatStressGuide.pdf>

TABLE 1

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						
46																					49	46						
45	NEVER IGNORE ANYONE'S SYMPTOMS DESPITE YOUR MEASUREMENTS!!!																		50	47	45	45						
44	Humidex	Action																			49	46	43	44				
43	45+	stop work																										
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																										
39	34-37	warning & more water																			49	47	45	43	41	39	37	
38	30-33	alert & water																			49	47	45	43	42	40	38	36
37	25-29	water as needed																										
36									50	49	47	45	44	42	40	39	37	35	34	36								
35								50	48	47	45	43	42	40	39	37	36	34	33	35								
34							49	48	46	45	43	42	40	39	37	36	34	33	31	34								
33					50	48	47	46	44	43	41	40	39	37	36	34	33	32	30	33								
32			50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	32								
31	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	32	30	29	28	31								
30	48	47	46	44	43	42	41	40	39	37	36	35	34	33	31	30	29	28	27	30								
29	46	45	43	42	41	40	39	38	37	36	35	33	32	31	30	29	28	27	26	29								
28	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	28								
27	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25			27								
26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25				26								
25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25					25								
24	35	34	33	33	32	31	30	29	28	28	27	26	25							24								
23	33	32	31	31	30	29	28	28	27	26	25									23								
22	31	30	30	29	28	27	27	26	25	25										22								
21	29	29	28	27	26	26	25													21								

Example: if the temperature is 30 °C and the relative humidity is 70%, the humidex rating is 41. This level is considered a level of “great discomfort” and exertion should be avoided.

TABLE 2

Recommended Actions Based on the Humidex Reading

Humidex 1	Response	Humidex 2
25 – 29	supply water to workers on an “as needed” basis	32 – 35
30 – 33	post Heat Stress Alert notice; encourage workers to drink extra water; start recording hourly temperature and relative humidity	36 – 39
34 – 37	post Heat Stress Warning notice; notify workers that they need to drink extra water; ensure workers are trained to recognize symptoms	40 – 42
38 – 39	work with 15 minutes relief per hour can continue; provide adequate cool (10-15°C) water; at least 1 cup (240 mL) of water every 20 minutes worker with symptoms should seek medical attention	43 – 44
40 – 41	work with 30 minutes relief per hour can continue in addition to the provisions listed previously;	45 – 46*
42 – 44	if feasible, work with 45 minutes relief per hour can continue in addition to the provisions listed above.	47 – 49*
45 or over	only medically supervised work can continue	50* or over

Humidex calculator: http://www.ohcow.on.ca/menuweb/heat_stress_calculator.htm

* at Humidex exposures above 45, heat stress should be managed as per the ACGIH TLV®

Humidex 1: Applies to unacclimatized workers performing moderate physical work
Also applies to acclimatized workers performing heavy physical work

Administer General Controls:

- i) Provide annual Heat Stress Training
- ii) Encourage adequate fluid replacement
- iii) Permit self limitation of exposure
- iv) Encourage the watching out for symptoms in co-workers
- v) Adjust expectations for workers coming back to work after absence

Note: Clothing and radiant heat must also be taken into account when using this Guideline.

Humidex 2: Applies to acclimatized workers performing moderate physical work
Also applies to unacclimatized workers performing light physical work

Administer Job Specific Controls in addition to General Controls

- i) Include all the General Controls above
- ii) Engineering controls to reduce physical job demands
- iii) Shield radiant heat
- iv) Increase air movement
- v) Reduce heat and moisture emissions at the source

