

Appendix B - The Humidex

Heat-related disorders are commonly caused by a combination of climate-related factors, work load, clothing and individual risk factors such as the worker's age, health, physical condition, medication and level of acclimatization. Due to the variance of individual susceptibility, effects of heat stress may be experienced by certain individuals earlier than expected. Supervisors should therefore begin to remind workers of heat-stress prevention strategies as the humidex level approaches 30°C.

The danger posed by heat and humidity has lead biometerologists to develop various discomfort indices in order to define the danger and alert the public. These indices are, to some degree, subjective. The level of discomfort or danger will depend on a person's age, health and physical condition, on the type of clothing worn and activity level. In addition to temperature and humidity, weather conditions such as the amount of sunshine and wind speed will also affect the "feel" of temperature and humidity.

The Canadian index, called **HUMIDEX**, combines the temperature and humidity into one number that is intended to reflect perceived temperature.

The following Humidex Heat Stress Response Plan, developed by the Occupational Health Clinics for Ontario Workers Inc. (OHCOW), is included as part of the Occupational Health and Safety Council of Ontario (OHSCO) Heat Stress Awareness Toolkit which is accessible online.

This chart can be used to determine humidex levels based on identified air temperature (°C) using a standard thermometer and % relative humidity using a hygrometer.



Humidex Based Heat Response Plan

What is it?

- The Humidex plan is a simplified way of protecting workers from heat stress which is based on the 2022 ACGIH Heat Stress TLV® (Threshold Limit Value®) which uses wet bulb globe temperatures (WBGT) to estimate heat strain. These WBGT's were translated into Humidex.
- The ACGIH prescribes an action limit (AL) based on the ability of “healthy hydrated unacclimatized workers to sustain thermal equilibrium”. This limit “has a small margin of safety, and some workers may experience heat-related disorders below the AL.”
- **Note:** in the translation process some simplifications and assumptions have been made, therefore, **the plan may not be applicable in workplaces with additional sources of heat and/or humidity** (follow steps #1-5 to ensure the Humidex plan is appropriate for your workplace, if not, follow the ACGIH Heat Stress and Strain TLV®). **This plan assumes moderate, unacclimatized work.**

Adjusted* Humidex	Response	Effective** WBGT (°C)
25 – 29	supply water to workers on an “as needed” basis	≤ 23.0°C
30 – 33	post Heat Stress Alert notice; encourage workers to drink extra water; start recording hourly temperature and relative humidity	23.1 – 24.0°C
34 – 37	post Heat Stress Warning notice; notify workers that they need to drink extra water; ensure workers are trained to recognize symptoms	24.1 – 25.0°C
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	25.1 – 26.0°C
40 – 41	work with 30 minutes relief per hour can continue in addition to the provisions listed previously	26.1 – 27.0°C
42 – 44	if feasible, work with 45 minutes relief per hour can continue in addition to the provisions listed above	27.1 – 29.0°C
45*** or over	only medically supervised work can continue	29.1°C*** or over

* “adjusted” means adjusted for additional clothing and radiant heat (see steps #4 & #5)

** “Effective” means adjusted for clothing (step #4) if the WBGT includes the globe temp

*** at Humidex above 45 (29.0°C WBGT), heat stress to be managed as per the ACGIH TLV®

General Controls: General controls apply to all workers and include providing annual heat stress training, encouraging adequate fluid replacement, permitting self-limitation of exposure, encouraging watching out for symptoms in co-workers, and adjusting expectations for workers coming back to work after an absence. Workers doing moderate work are not considered acclimatized in Ontario unless they regularly work around significant heat and/or humidity sources (e.g., in foundries, around ovens, etc.).

Job-Specific Controls: Job-specific controls include (in addition to general controls) engineering controls to reduce physical job demands, shielding of radiant heat, increased air movement, reduction of heat and moisture emissions at the source, adjusting exposure times to allow sufficient recovery, and personal protective equipment that provides for body cooling. Apply the hierarchy of controls.



April 2024

Limitations: this table is based on work with **little or no radiant heat**, assuming wearing **regular summer clothing**; if your specific working conditions vary from these assumptions, see the steps 1-5 listed below to make adjustments

Humidex Heat Response Plan

Temp (in °C)	relative humidity (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	NEVER IGNORE ANYONE'S SYMPTOMS DESPITE YOUR MEASUREMENTS!!!																		49	48		
47	adjusted*																		50	47	47	
46	Humidex	Action																	49	46	46	
45	45+**	only medically supervised work																50	47	45	45	
44	42-44	75% relief																49	46	43	44	
43	40-41	50% relief																49	47	45	42	43
42	38-39	25% relief														50	48	46	43	41	42	
41	34-37	warning & double water														48	46	44	42	40	41	
40	30-33	alert & water													49	47	45	43	41	39	40	
39	25-29	water as needed												49	47	45	43	41	39	37	39	
38	* “adjusted” means adjusted for additional clothing and radiant heat (see steps 2 & 5)											49	47	45	43	42	40	38	36	38		
37	** above a humidex of 45 use the ACGIH Heat Stress/Strain TLV											49	47	45	44	42	40	38	37	35	37	
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	24		27		
26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25	24			26		
25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25	24				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	24	24							23		
22	31	30	30	29	28	27	27	26	25	25	24									22		
21	29	29	28	27	26	26	25	24	24											21		
	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%			
relative humidity (in %)																						

April 2024