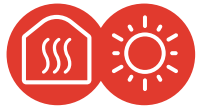


Heat Stress RESPONSE PLAN

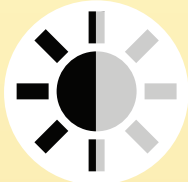


An Action Plan to Protect Workers

Combining temperature and humidity to calculate estimated heat stress

● Step 1: Select Location

Based on factors such as:



DIRECT SUN / SHADE



AIR CONDITIONING



VENTILATION



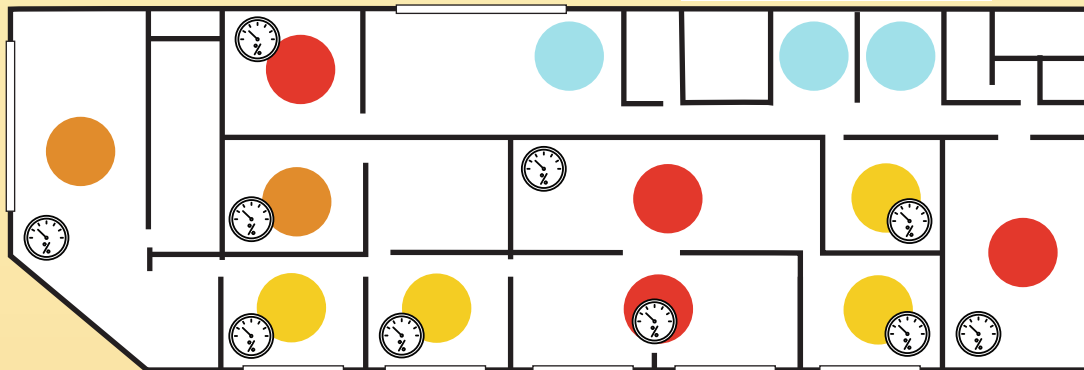
MACHINERY



OTHER HEAT SOURCES

● Split the workplace into "heat stress zones"

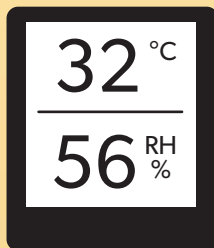
● Extremely Hot ● Warm
● Hot ● Cool



Sample Workplace Floorplan

- Identify a location within each zone where measurements can be taken.

● Step 2: Measure Heat and Humidity



- Put a thermal hygrometer in each location.

Thermal hygrometers are an easy, effective and affordable* way to measure heat and humidity in the workplace. If you want to base your action plan on a single measurement, you must select the highest heat stress zone.

*\$10-\$50 at hardware or office supply stores

Employers and workers should never ignore signs of heat stress, regardless of the Humidex!

● Step 3: Determine Humidex

Once you have measured the temperature and humidity for each heat stress zone, use these measurements to determine the humidex in the chart below:

TEMP (°C)	RELATIVE HUMIDITY (%)																		
	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%
49																			50
48																			49
47																			50
46																			49
45																	50		47
44																	49		46
43																49	47	45	42
42															50	48	46	43	41
41															48	46	44	42	40
40															49	47	45	43	41
39														49	47	45	43	41	39
38														49	47	45	43	41	39
37														49	47	45	43	41	39
36														49	47	45	43	41	39
35														49	47	45	43	41	39
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33														49	47	45	43	41	39
32														49	47	45	43	41	39
31														49	47	45	43	41	39
30														49	47	45	43	41	39
29														49	47	45	43	41	39
28														49	47	45	43	41	39
27														49	47	45	43	41	39
26														49	47	45	43	41	39
25														49	47	45	43	41	39
24														49	47	45	43	41	39
23														49	47	45	43	41	39
22														49	47	45	43	41	39
21														49	47	45	43	41	39
	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%

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 Steps 1 to 5 to make adjustments.

For Response Guidance and Advice see Response Table below (Step 6).

*For humidex above 45, heat stress should be managed as per the ACGIH TLV®

You can also use OHCOW's Humidex-based Heat Stress Calculator located at:



Never ignore anyone's symptoms, despite your measurements

● Step 4: Adjust for Clothing*

Sweat evaporation is the primary way that the body eliminates heat, so workers should wear clothing that makes it easy for sweat to evaporate.

The Humidex-based Heat Response Plan assumes that the worker is wearing regular summer clothing such as:



ADJUSTMENTS should be made if the worker is wearing something different or in addition to their summer clothes. For example:



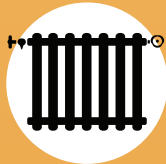
For different clothing configurations, estimate the adjustment by comparing them with cotton overalls:



NOTE: If clothes **do not** allow sweat evaporation (encapsulated suits) heat stress should be managed by monitoring vital signs (see ACGIH TLV®).

• Step 5: Adjust for Radiant Heat*

There are conditions that create “atmospheric heat” and there are sources of “radiant heat.” Radiant heat comes from a specific source, such as:



RADIATOR



OVEN



SUN



HEAVY MACHINERY
(with large engine)

The Humidex-based Heat Response Plan assumes there is little to no radiant heat, so adjustments should be made if radiant heat is present.

+ 3 or 4°

to the Humidex measurement if workers are in direct sunlight between the hours of 10 am and 5 pm*.



*depending on cloud coverage

For other radiant heat sources adjust according to how the heat source compares to direct sunlight.



LESS THAN

+ 1 or 2°



EQUAL TO

+ 3 or 4°



MORE THAN

+ 5 or 6°

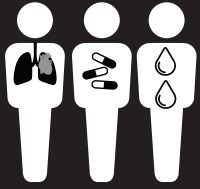
• Step 6: Identify Response

Once you have determined the Humidex and made appropriate adjustments (Steps 4 and 5), use that measurement to identify the most effective response in the chart below.

ADJUSTED HUMIDEX	RESPONSE
25 – 29	<ul style="list-style-type: none"> Supply water to workers on an “as needed” basis
30 – 33	<ul style="list-style-type: none"> Post Heat Stress Alert notice. Encourage workers to drink extra water. Start recording hourly temperature and relative humidity.
34 – 37	<ul style="list-style-type: none"> Post Heat Stress Warning notice. Notify workers that they need to drink extra water. Ensure workers are trained to recognize symptoms.
38 – 39	<ul style="list-style-type: none"> 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. Seek medical attention if experiencing symptoms.
40 – 41	<ul style="list-style-type: none"> Work with 30 minutes relief per hour can continue in addition to the provisions listed above.
42 – 44	<ul style="list-style-type: none"> Work with 45 minutes relief per hour can continue if feasible, in addition to the provisions listed above.
45 or over	<ul style="list-style-type: none"> Only medically supervised work can continue.

Acclimatization

*It should be noted that heatwaves in Ontario rarely last long enough for workers to acclimatize. In Ontario, workers are considered acclimatized only if they work around radiant heat sources on a regular basis.



VULNERABILITY: There are many permanent and temporary conditions that can make a person more vulnerable to heat strain, so workers should be able to adjust their work appropriately.

YOUNG WORKERS: Workers who are young and healthy often do not think they will be impacted by heat stress, and may need guidance about what adjustments would benefit them.

CONTROLS

General Controls (for ALL workers)



Regular heat stress training



Self-limitation of heat exposure



Adequate fluid replacement



Watch for symptoms in others



Adjust expectations for returning workers

Specific Controls (for certain workers)



Reduce heat and moisture at source



Shield workers from source of radiant heat



Increase amount of air movement



Adjust exposure times to allow recovery



Reduce physical demands through engineering

Note 1: If the Humidex is above 30° this process should be repeated at least once each hour.

Note 2: If the Humidex is above 45°, heat stress should be managed according to the [ACGIH Heat Stress Threshold Limit Value](#).

Technical Notes

The ACGIH specifies an action limit and a TLV® to prevent workers' body temperature from exceeding 38°C (38.5°C for acclimatized workers). Below the action limit (Humidex 1 for work of moderate physical activity) most workers will not experience heat stress.

Note: In the translation process some simplifications and assumptions have been made, therefore, the plan may not be applicable in all circumstances and/or workplaces (follow steps #1-5 to ensure the Humidex plan is appropriate for your workplace).



This information is designed for simple heat stress (hot weather) situations. For more precise evaluation and control see the following additional resources:

NEW! [Heat Stress Awareness, Prevention, and Monitoring Guides](#)

04-08-2024



For other infographics in this series, or to learn more about working in the heat, see our Heat Stress Toolkit:



Scan or Click