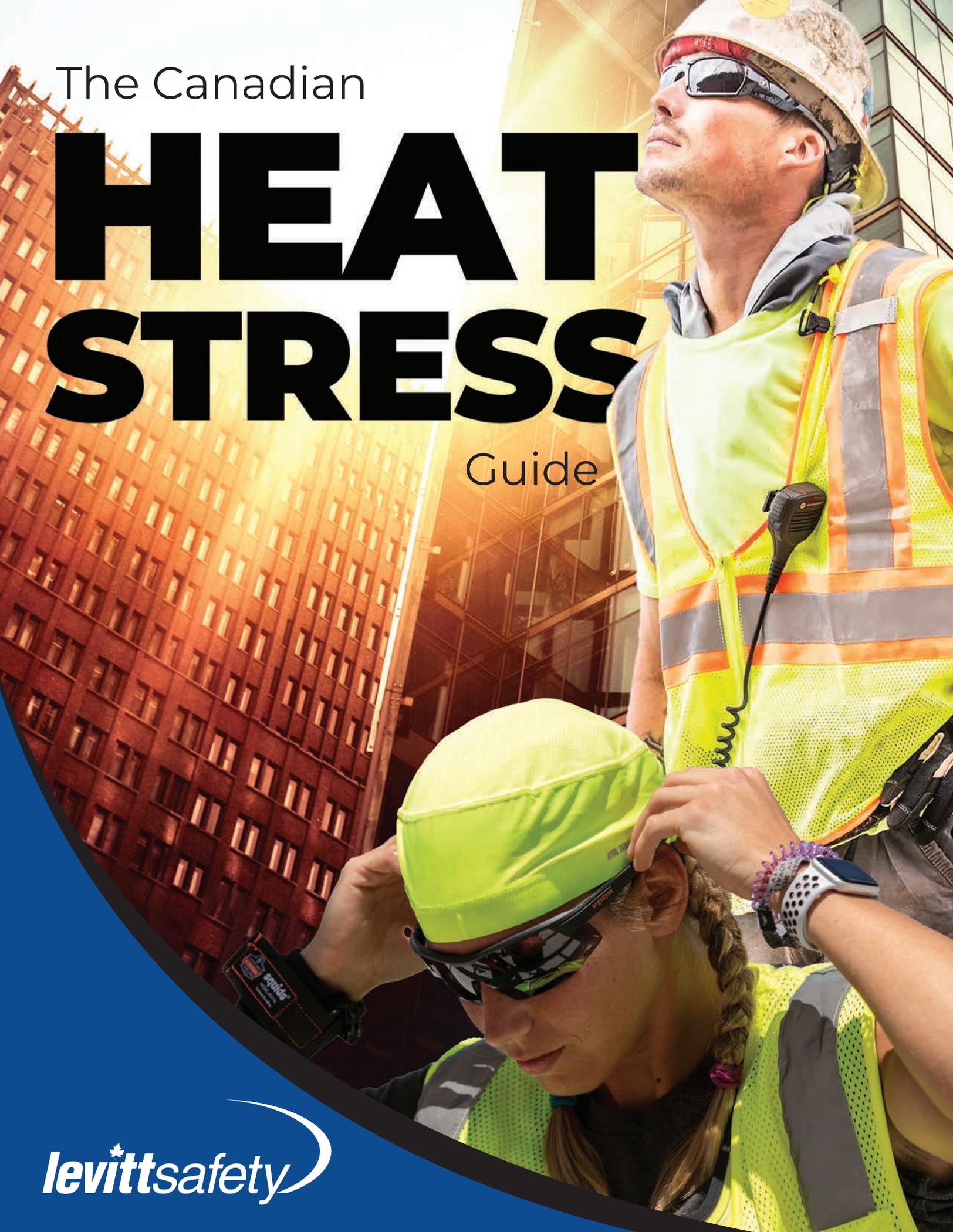


The Canadian

# HEAT STRESS

Guide



*levittsafety*

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- B. Importance of Managing Heat Stress & Understanding Your Responsibility
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# 1. Introduction to Heat Stress

## A. Definition & Causes of Heat Stress:

### What is Heat Stress?

Heat stress is a condition that occurs when the body is unable to regulate its internal temperature in response to external heat. The human body relies on maintaining a stable core temperature to function properly, and when exposed to high temperatures, especially in combination with high humidity, the body may struggle to dissipate heat.

### Key Factors Contributing to Heat Stress Include:

- **Environmental Conditions:** High temperature and humidity, lack of air movement, and exposure to radiant heat sources can limit the body's ability to cool itself through sweating.
- **Physical Activity and Clothing:** Physical demands of a job, required protective clothing, and frequency/duration of breaks can increase the risk of heat stress.
- **Inadequate Hydration:** Dehydration reduces the body's ability to sweat and cool down. It is crucial to maintain proper hydration, especially in hot conditions.
- **Lack of Acclimatization:** Individuals who are not accustomed to working in hot environments are more susceptible to heat stress. Acclimatization allows the body to adapt gradually to heat.

Preventive measures include personal/area monitoring, staying hydrated, taking breaks in shaded or cooler areas, wearing appropriate clothing, and acclimatizing gradually to hot conditions. It's crucial to recognize and address the signs of heat stress promptly to avoid more severe complications.

## B. Importance of Managing Heat Stress & Understanding Your Responsibility:

Understanding your responsibility in preventing heat stress is important, especially in environments where individuals may be exposed to high temperatures. Responsibilities for an employer, supervisor, or individual working in a hot environment can include:

### Employer/Management Responsibilities:

- **Provide Training:** Ensure that all employees are trained to understand the hazards, recognize the signs and symptoms, and understand preventive measures related to heat-related illness.
- **Implement Policy:** Establish and enforce a written policy related to working in hot conditions, including guidelines for breaks, hydration, and protective equipment.
- **Monitor Conditions:** Regularly assess environmental conditions and adjust work schedules if necessary to reduce exposure to extreme heat.
- **Clothing:** Provide light, breathable clothing and sun protection and encourage use.
- **Provide Adequate Hydration:** Ensure access to clean, cool drinking water, and encourage employees to stay hydrated throughout the workday.
- **Provide Shade:** If possible, offer shaded or air-conditioned areas for breaks to allow employees to cool down.

### Supervisor Responsibilities:

- **Monitor Workers:** Keep an eye on workers for signs of heat stress and encourage them to take breaks as needed.
- **Encourage Hydration:** Remind workers to stay hydrated by drinking water regularly.
- **Adjust Work Schedules:** When possible, schedule strenuous tasks during cooler parts of the day and implement work-rest cycles.
- **Promote Acclimatization:** Gradually introduce workers to hot conditions to allow their bodies to acclimatize.



### Individual Responsibilities:

- **Self-Monitoring:** Be aware of your body and recognize the early signs of heat stress.
- **Hydration:** Drink water regularly, even if you don't feel thirsty. Avoid consumption of caffeinated or alcoholic beverages.
- **Clothing:** Wear light-coloured, breathable, loose-fitting clothing that allows heat to dissipate from the body. Include sunscreen and head protection if necessary.
- **Take Breaks:** Take regular breaks in shaded or cool areas to prevent prolonged exposure to heat.
- **Report Symptoms:** If you or a co-worker experience symptoms of heat stress, report it promptly to supervisors or management.

Understanding and fulfilling these responsibilities help create a safer working environment and reduce the risk of heat-related illnesses.

### C. Hierarchy of Safety Controls & Heat Stress:

To help alleviate the impact of heat stress employers can use the hierarchy of safety controls to minimize the hazard in the workplace.

Most effective



Least effective



**a. Elimination – Physically remove the hazard**

- Remove or reschedule work during extreme heat.

**b. Substitution – Replace the hazard**

- Substitute processes or materials with those that generate less heat.

**c. Engineering Controls – Isolate people from the hazard**

- Outside work should be done in shade and covered areas, including the addition of tents to prevent direct heat exposure.
- Install cooling stations or misting fans where employees can take breaks and cool down between tasks.
- Indoor work should be adequately air-conditioned with effective ventilation and local exhaust to remove hot air.
- Reduce manual workload and work intensity by using carts and lifting devices.
- Installing heat barriers or shields and insulating hot surfaces.
- Increase ventilation with fans to increase air movement and sweat evaporation.

**d. Administrative Controls – Change the way people work**

- Start an acclimatization program to gradually increase the tolerance to high temperatures; approximately 7-14 days. Ideally, two continuous hours for five of the last seven days.
- Change working hours to earlier in the morning or later.
- Adjust work-rest cycles to allow for more time to cool down and return to a normal body temperature.
- Schedule the hardest physical tasks for the coolest part of the day and the slower-paced work during the hottest parts of the day. Supervisors can also rotate work activities or use additional workers to reduce heat exposure for each member of the work crew.
- Adoption of personal and area heat stress monitoring so changing conditions can be addressed early.
- Supervise workers. Create a buddy system and train workers to watch for the first signs and symptoms of heat stress.
- Implement a fluid replacement strategy to avoid dehydration.
- Workstations should be at a reasonable distance from heat sources.
  - Develop a training program specific to heat stress so workers are aware of the warning signs.
  - Design emergency procedures. Assign one person trained in first aid to work each shift.

**Elimination**

Physically remove the hazard

**Substitution**

Replace the hazard

**Engineering controls**

Isolate people from the hazard

**Administrative controls**

Change the way people work

**PPE**

Protect the worker with personal protective equipment

**e. PPE (Personal Protective Equipment) – Protect the worker with PPE**

- Indoor high radiant heat reflective clothing may help.
- Utilize PPE that offers moisture-wicking, UV and UPF sun protection.
- Use cooling PPE such as cooling vests, towels, and bandanas.
- Wear broad-brimmed hats, add shades, and neck flaps.
- Safety glasses with tinted polarized lenses should be worn outside.
- 30 SPF sunblock or better.
- Adopt new PPE designs specific for heat stress. Examples:

**o V-Gard® C1™ Hard Hat** that is 11% cooler than traditional hard hats.



**o DuPont™ Tyvek® 400D Heat Stress Coverall** that combines the protection of the Tyvek® fabric on the front and comfort and breathability of the DuPont™ ProShield® on the back.



**Bisley® Men's X-Back Short Sleeve Shirt**

Durable lightweight performance wicking fabric with cotton backing. Also available in long-sleeve, high vis orange and women's fit.



**Bisley® X-Airflow™ Women's Work Shirt**

Features ventilation at multiple heat stress areas on side of body and underarms. Perforated reflective tape to help relieve heat stress and allow for better movement. Also available in high vis yellow and men's cut.



**Viking® Bamboo Lined Safety T-Shirt**

Comfortable Bamboo lining, UPF of 50+ blocks 98% of UV Radiation. Also available in short sleeve and high vis orange.

## 2. Signs & Symptoms of Heat Stress

Let's explore the various heat-related illnesses, starting with mild symptoms such as heat edema, heat rash and heat cramps, and moving through to more severe conditions like heat exhaustion, heat syncope and life-threatening heat stroke. We will delve into the causes, symptoms, and give prevention or treatment tips to alleviate these heat-related illnesses to ensure your worker's well-being during the hot and humid weather.



### Heat Edema:

**Cause:** Swelling among non-acclimatized individuals working in hot conditions, primarily noticeable in the ankles.

**Prevention:** Acclimate to hot conditions gradually, elevate legs when possible, and maintain hydration.



### Heat Rashes:

**Cause:** Tiny red spots with severe itching in hot, humid environments due to sweat gland ducts becoming plugged.

**Prevention:** Keep skin dry, use powders, wear loose clothing, and return to a cooler environment for relief.



### Heat Cramps:

**Cause:** Sharp muscle pains resulting from a salt imbalance due to heavy sweating, amplified by inadequate fluid intake.

**Prevention:** Move to a cooler area, hydrate with electrolyte-rich fluids, and rest to alleviate cramps.



### Heat Exhaustion:

**Cause:** Loss of body water and salt through excessive sweating, leading to symptoms such as heavy sweating, weakness, dizziness, visual disturbances, intense thirst, nausea, headache, muscle cramps, breathlessness, palpitations, and skin which is pale, cool, and moist.

**Prevention:** Move to a cool area, provide cool water if possible, and seek medical attention. Can progress to heat stroke if left untreated.



### Heat Syncope:

**Cause:** Heat-induced dizziness and fainting due to decreased blood flow to the brain, often occurring among unacclimatized individuals.

**Prevention:** Rest in a cool area, avoid vigorous activity in extreme heat, and rehydrate to facilitate rapid recovery.



### Heat Stroke:

**Cause:** Most severe heat illness, marked by a medical emergency, and characterized by a high body temperature, loss of consciousness, confusion, and hot, dry skin.

**Treatment:** Move to a cooler place, cool the body with ice packs, and seek immediate medical attention. Differentiate between exertional and non-exertional types based on sweating patterns.



## 3. Factors Contributing to Heat Stress:

A variety of factors can contribute to an individual's susceptibility to heat stress, including environmental and individual factors. Understanding these factors and identifying them in your work environment is an important component of an effective heat stress policy.

### A. Environmental Factors:

- **Hot Temperature:** High temperatures can overwhelm the body's natural cooling mechanisms.
- **High Humidity:** High humidity can hinder the body's ability to cool down by sweating, as moisture cannot evaporate off the skin.
- **Wind or Air Movement:** Low wind speeds or poor air movement can reduce the body's ability to lose heat through evaporation.
- **Radiation:** Direct sunlight can increase the temperature, making it harder for the body to cool down.
- **Indoor Heat Sources:** Increased temperature and humidity from plant equipment can make it difficult for the body to dissipate heat and maintain a healthy core temperature.
- **High Physical Demand:** When the body engages in strenuous physical tasks, it produces more heat, which can lead to an imbalance between heat production and heat loss.
- **Poor PPE & Clothing Worn:** Clothing and PPE that are not breathable or that cover a large portion of the body can restrict the evaporation of sweat and increase the body's temperature.

### B. Individual Factors:

- **Medication:** Both prescription and non-prescription substances can have an impact on a person's sensitivity and reaction to heat.
- **Pre-existing Health Conditions:** Certain medical conditions, such as obesity, diabetes, heart, and respiratory disease can make it more challenging for the body to regulate temperature. Lower circulatory system capacity can have an impact and individuals with lower sweat production are more susceptible to heat-related illnesses because sweat is the primary method by which the body cools itself.

- **Age of Workers:** Older adults are more susceptible to heat stress due to their reduced ability to regulate body temperature along with reduction in thirst sensation, fitness level, sweating ability, and increased susceptibility to chronic dehydration.
- **Pregnancy:** Pregnant women are more susceptible to heat stress due to their increased body temperature and reduced ability to regulate temperature.
- **Acclimatization:** Unacclimatized workers are more susceptible to heat stress because they have not yet adapted to the heat.
- **Fitness Level:** People with lower fitness levels may have a harder time coping with heat than those who are more physically active.
- **Hydration Level:** Dehydration can increase the risk of heat stress.
- **Skin Diseases & Rashes:** People with skin diseases and rashes are more susceptible to heat-related illnesses. This is because the skin plays a crucial role in regulating body temperature.



# 4. Regulatory Compliance & Obligations

## A. Wet Bulb Globe Temperature (WBGT):

Workplaces in Canada generally fall under federal or provincial jurisdictions and rely on the ACGIH (American Conference of Governmental Industrial Hygienists) for guidance on Heat (Thermal) Stress.

Limits are established in units of WBGT degrees Celsius (°C) and take environmental factors, such as air temperature, humidity, radiant heat, and air movement into account. This composite temperature provides a more accurate reflection of the heat stress experienced by individuals compared to traditional measures like the heat index or humidex.

The uniqueness of WBGT lies in its consideration of not just the temperature but also the cooling effect of wind and the impact of solar and thermal radiation on the body. By integrating these variables, WBGT offers a comprehensive assessment of the environmental conditions contributing to heat stress, making it an invaluable tool for workplace safety in high-temperature environments.

### Components of WBGT:

- **Natural Wet-Bulb Temperature:** This component is essential for understanding the cooling effect of evaporation on the body.

Measured with a thermometer covered in a water-soaked cloth and exposed to airflow, it reflects the temperature, humidity, and the body's potential for evaporative cooling. In humid conditions conditions, where the air is saturated with moisture, the evaporation rate decreases, leading to higher perceived heat stress.

- **Globe Temperature:** Measured with a globe thermometer, this component gauges the amount of radiant heat present. The thermometer is encased in a hollow, black globe that absorbs radiant heat from sunlight or other sources, mimicking the heat absorption by the human body. This measure is crucial in environments where direct sunlight or significant radiant heat sources (like furnaces or machinery) are present, as it influences the body's ability to dissipate heat.

- **Air Temperature:** The most straightforward of the three measures uses a standard thermometer. While it is the most commonly understood indicator of heat, on its own, air temperature does not fully represent the heat stress risk. It does not account for humidity, wind speed, or radiant heat, which significantly affects human heat perception and stress.

These measurements are then weighted and combined according to a formula that accounts for their relative contributions to heat stress. The specific weighting can vary depending on the setting (e.g., indoor vs. outdoor) and the activities performed. For example, in direct sunlight, the globe temperature carries more weight due to the significant impact of solar radiation on heat stress.



## The wet bulb globe temperature (WBGT) is calculated as follows:

### For outdoors with direct sun exposure:

$$\text{WBGT} = 0.7 \times \text{Wet Bulb} + 0.2 \times \text{Globe} + 0.1 \times \text{Air}$$

### For indoors or outdoors without direct sun exposure:

$$\text{WBGT} = 0.7 \times \text{Wet Bulb} + 0.3 \times \text{Globe where:}$$

Wet Bulb = natural wet bulb temperature measured by using a thermometer whose bulb is covered with wet cotton cloth and is cooled by the natural air movement

Globe = temperature measured using a black globe thermometer

Air = temperature measured using a conventional thermometer

All temperatures are to be expressed in °C.



The calculated value is then compared to the following Table 1 to determine the recommended work/rest cycle:

<p align="center"><b>Table 1</b> ACGIH Screening Criteria for Heat Stress Exposure (WBGT values in °C) for 8-hour workday, five days per week with conventional breaks</p>								
Allocation of Work in a Work/Rest Cycle	Acclimatized				Action Limit (Unacclimatized)			
	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
75 - 100%	31.0	28.0	--	--	28.0	25.0	--	--
50 - 75%	31.0	29.0	27.5	--	28.5	26.0	24.0	--
25 - 50%	32.0	30.0	29.0	28.0	29.5	27.0	25.5	24.5
0 - 25%	32.5	31.5	30.5	30.0	30.0	29.0	28.0	27.0

Notes:  
Assumes 8-hour workdays in a 5-day workweek with conventional breaks. Threshold Limit Values (TLVs) assume that workers exposed to these conditions are adequately hydrated, are not taking medication, are wearing lightweight clothing (long-sleeve shirts and pants) and are in generally good health.

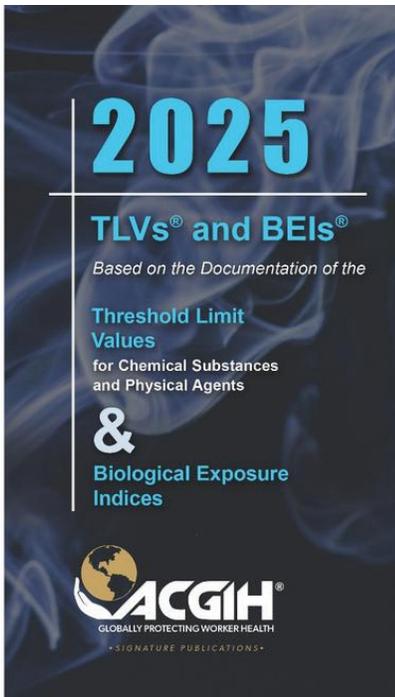
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**Examples of workloads:**  
**Rest** - sitting (quietly or with moderate arm movements)  
**Light work** - sitting or standing to control machines; performing light hand or arm work (e.g. using a table saw); occasional walking; driving  
**Moderate work** - walking about with moderate lifting and pushing or pulling; walking at a moderate pace, (e.g. scrubbing in a standing position)  
**Heavy work** - pick and shovel work, digging, carrying, pushing/pulling heavy loads; walking at fast pace, (e.g. carpenter sawing by hand)  
**Very Heavy** - very intense activity at a fast to maximum pace, (e.g. shovelling wet sand)

Adapted from: 2024 TLVs® and BEIs® - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati: American Conference of Governmental Industrial Hygienists (ACGIH), 2024

The ACGIH exposure limits are intended to protect most workers from heat-related illnesses. If you are wearing heavier clothing, then the exposure limit should be lowered. ACGIH recommendations for such situations are suggested in Table 2:

<b>Table 2</b> Correction of TLV for Clothing (Values cannot be added when wearing multiple layers)	
Clothing Type	WBGT Correction (°C)
Work clothes (long sleeve shirt and pants)	0
Cloth (woven material) coveralls	0
SMS (Spunbonded - Meltdown - Spunbonded) polypropylene coveralls	+ 0.5
Polyolefin coveralls	+ 1
Double-layer woven clothing	+ 3
Limited-use vapour-barrier coveralls	+ 11
<b>Note:</b> These values are not to be used for completely encapsulating suits. Coveralls assume only modest clothing is underneath, not a second layer of clothing.	
Adopted from: 2024 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati, Ohio: American Conference of Governmental Industrial Hygienists	



**Challenges & Limitations of WBGT:**

One of the main difficulties of using WBGT lies in the variability of environmental conditions, which can change rapidly and affect the accuracy of WBGT readings. For example, sudden shifts in weather, such as cloud cover or wind speed, can

alter the thermal environment, necessitating constant monitoring and adjustment of work practices.

While WBGT provides a valuable framework for assessing heat stress risk, it may not capture all factors affecting individual susceptibility

to heat-related illnesses. Personal risk factors, such as age, medical conditions, medication use, and acclimatization level, can influence an individual’s response to heat and are not directly accounted for by WBGT alone.

According to ACGIH guidelines, personal factors to consider in your program can also include:

- Sustained (Several Minutes) Heart Rate in excess of 180 bpm (beats per minute) minus the individuals age in years (180 – age) for individuals with normal cardiac performance; or
- Body core temperature is greater than 38.5° C for medically selected and acclimatized personnel; or greater than 38° C in unselected, unacclimatized workers; or
- Recovery heart rate at 1 minute after a peak work effort is greater than 120 bpm; or
- There are symptoms of sudden and severe fatigue, nausea, dizziness, or light-headedness.

Historically, this component has been a challenge for most workplaces as it requires

continuous access to employees and interruptions to their workday. The emergence of wearable technology that can continuously monitor an employee's physiological signs of heat stress and provide real-time data and alerts has improved this situation.

### Humidex:

Some jurisdictions allow humidex to be used as a measure of Heat Stress risk.

The Occupational Health Clinics for Ontario Workers Inc. (OHCOW) has prepared a document called Humidex Based Heat Stress Plan that translates WBGT into Humidex values. An explanation of the plan and the calculator can be found at the following link: <https://www.ohcow.on.ca/resources/apps-tools-calculators/humidex-based-heat-stress-calculator-plan/>. Confirm that a Humidex Based Heat Stress Plan is appropriate for your work environment prior to use.

## B. Understanding Your Provincial Requirements:

Canada has several jurisdictions with regulations for heat stress that include measures to protect workers.

In most, the ACGIH recommendations are used as the guiding document, however there are variations. It is important to understand the regulations applicable to your workplace so that all requirements are incorporated into your program.

## C. Proposed Legislation for Ontario:

Bill 222 (Heat Stress Act, 2024) was introduced in the Ontario legislature and has advanced through first reading; this bill aims to establish **mandatory heat stress prevention program requirements**. This signals a shift towards **prospective legal requirements** for structured heat stress management (training, monitoring, controls, documentation) in Ontario.



## 5. Personal Monitoring

Personal monitoring is important to protect workers from the hazards of heat exposure. By using wearable devices that measure factors such as core body temperature, heart rate, and environmental conditions, employers can gain real-time insights into the heat exposure experienced by individual workers. This information is essential for identifying employees who are at risk, adjusting work-rest cycles, and implementing targeted interventions to reduce worker risk.

### SlateSafety Band V2 & Beacon:



## 6. Area Monitoring Devices

Area monitoring is vital to assessing and controlling thermal environments in specific work areas. It involves measuring various factors such as ambient temperature, wet bulb temperature, humidity, radiant heat, and air velocity to calculate the WBGT (Wet Bulb Globe Temperature) index. This value is used to determine work-rest cycles as part of a heat stress management policy that includes workplace alerts when safe levels are exceeded.

### WBGT Heat Stress Monitors:



The combined data provided by these tools assist with the knowledge required to make decisions on appropriate controls for the workplace.

# 7. Personal Protective Equipment

Personal Protective Equipment (PPE) is key for workers in Canada who are working or exposed to heat stress.

Under the Occupational Health and Safety Act (OHSA), employers have a general duty under clause 25(2)(h) to take every precaution reasonable in the circumstances for the protection of a worker. This general duty includes protecting workers from hazardous thermal conditions that may lead to heat-related illnesses.

## A. The Four Types of Cooling PPE Technology:

There are four types of cooling PPE technology - Wet Evaporative, Dry Evaporative, Phase Change, and Absorptive Cooling – that are available to help workers stay cool and comfortable in hot environments.

To choose the right cooling PPE, assess workplace temperature, humidity, and job demands. Ensure proper fit and comfort and provide training on usage and maintenance. Regularly monitor and evaluate the program for effectiveness and make improvements when opportunities are available.

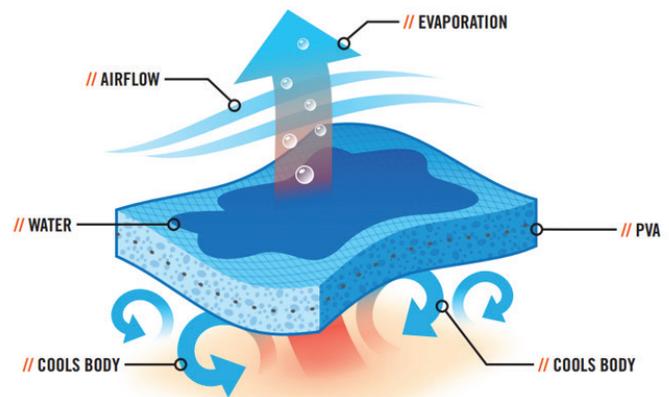
Here's how you can implement the four types of cooling PPE technology in your workplace:

### 1. Wet Evaporative Cooling

Wet evaporative cooling technology is based on the principle of evaporation, where water is absorbed into a cooling fabric or material, and as the water evaporates, it takes away heat from the body, providing a cooling effect. This type of cooling technology is ideal for hot and dry outdoor environments with low/moderate humidity and sufficient airflow. These products are designed to be soaked in water, wrung out, and then worn to provide up to four hours of cooling relief.

Here are the different fabrics that use water and airflow to deliver instant cooling.

**PVA:** Absorbing like a sponge, hyper-evaporative Poly Vinyl Alcohol (PVA) holds the most water for maximum cooling power while remaining mostly dry to the touch.

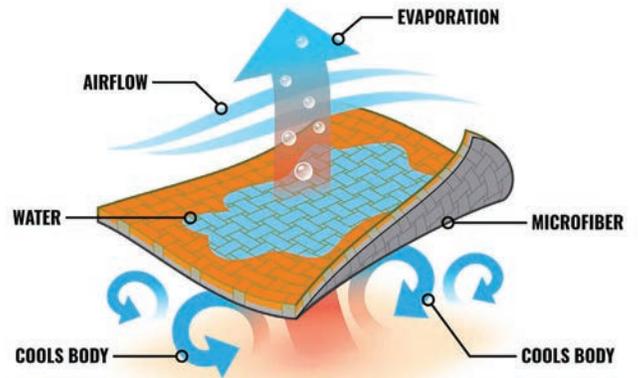


**Chill-Its Evaporative Cooling Bandana Headband**

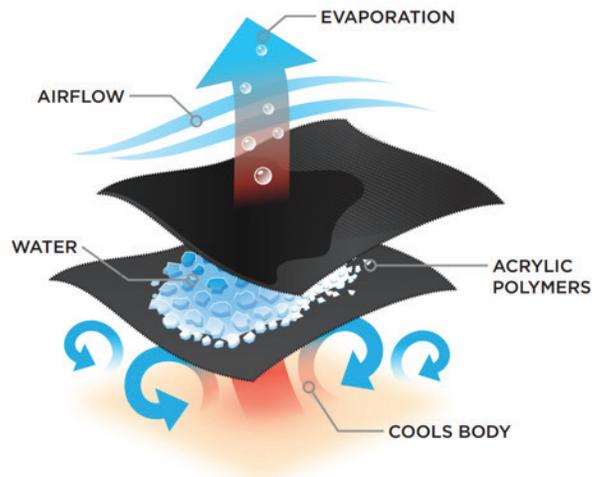


**Chill-Its Evaporative Cooling Towel**

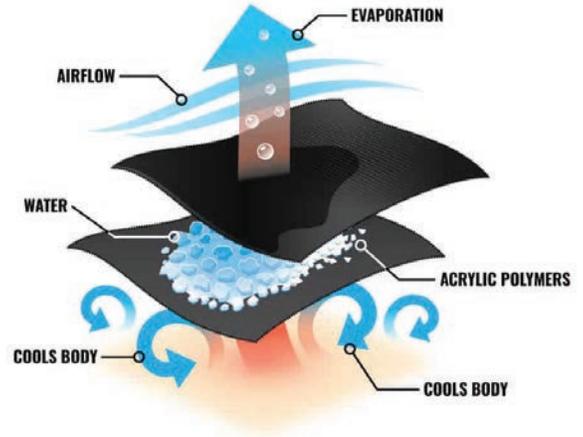
**MICROFIBER:** Ultra-soft, absorbent and moisture-wicking, microfiber is an always-on double threat—comfortably absorbing and wicking sweat when dry, refreshingly cool when wet.



**ACRYLIC POLYMERS:** When soaked in cold water, super-absorbent acrylic polymers plump up with moisture to deliver extended cooling relief.



**EMBEDDED POLYMERS:** Similar to acrylic polymers, embedded polymers absorb cold water to deliver the same prolonged cooling with less of the bulk.



**2. Dry Evaporative Cooling:**

Dry evaporative cooling technology is like wet evaporative cooling, but instead, it gradually releases water through evaporation from the inside of a special cooling material to create a cooling effect. This type of cooling technology is best for hot and dry outdoor environments with low humidity and sufficient airflow. These products are designed to be worn close to the skin, and as the body heat is absorbed by the cooling material, it is released into the air, providing a cooling effect for up to three days.



**Chill-Its Dry Evaporative Cooling Vest**

**3. Phase Change Cooling:**

Phase change cooling technology uses a special material that can change phase from solid to liquid and back again, absorbing and releasing heat in the process. This type of cooling technology is best for hot indoor environments (no airflow required). These products are designed to be worn close to the body, and as the phase change material absorbs heat, it changes phase, providing a cooling effect from two to four hours long.



**Chill-Its Premium FR Phase Change Cooling Vest**

#### 4. Absorptive Cooling:

Our body's natural cooling mechanism to regulate body temperature is through sweating. However, excessive sweating can cause discomfort and potential safety risks, for instance having a slippery grip or sweat droplets in the eyes while working. While any fabric could be used as a makeshift solution, it may not provide the desired results and could potentially hinder performance if not specifically designed for that purpose. Absorptive cooling PPE is designed to wick sweat away from the body, using a special material that can absorb and retain large amounts of water, which then evaporates to provide a cooling effect. This type of cooling technology is ideal for providing long lasting cooling relief in hot environments.



**Chill-Its High Performance Skull Cap with Terry Cloth Sweat Band**



**Dynamic™ Universal Sweat Band**

## B. Use of Shading & Reflective Surfaces:

The use of shading and reflective surfaces in high-heat settings can significantly reduce heat stress for workers.

By providing shade to workers, employers can reduce their solar UV exposure and promote a cooler work environment. This can be achieved through the implementation of 'built' shade, such as permanent and temporary shade structures. Employers can also promote the use of natural shade from trees for employees to rest under, as this can significantly reduce heat stress.

One effective strategy for providing shade is by utilizing pop-up tents. These tents can be used in various work environments, providing a versatile and comfortable workspace. They can be set up quickly and easily, allowing workers to focus on their tasks without worrying about the heat.

Stainless steel, aluminum, or other bright metal surfaces reflect heat back towards the source. This reflective property can help reduce the heat buildup in high-heat settings. By incorporating reflective surfaces into the workplace design, employers can further enhance the cooling effect and reduce heat stress for workers.

Investing in these measures can demonstrate a commitment to worker health, fostering a healthier and more productive workplace. By providing a comfortable and productive environment, employers can enhance employee satisfaction, reduce absenteeism, and improve overall workplace performance.



**SHAX Heavy-Duty Pop-up Tent (10x10Ft)** - Add your company logo to any tent



**Glowear Hi-Vis Hard Hat Neck Shade**



**Chill-Its Universal Hard Hat Brim & Neck Shade**



## 8. Hydration Solutions

Water makes up about 60% of the human body, and it plays a vital role in various bodily functions such as regulating body temperature, maintaining healthy skin and joints, digesting food, helping the brain function, and producing necessary bodily fluids. Dehydration can occur when we lose more bodily fluids than we take in, leading to a quick and higher loss of fluids and electrolytes. The combination of heat stress and dehydration means that people performing skilled tasks may become tired faster than normal and have trouble concentrating.

When we sweat, we not only lose water but also electrolytes like sodium, potassium, and chloride. These electrolytes help the body maintain fluid balance and keep cells in our bodies working properly.

To prevent heat stress, it's essential to drink plenty of fluids before, during, and after physical work.

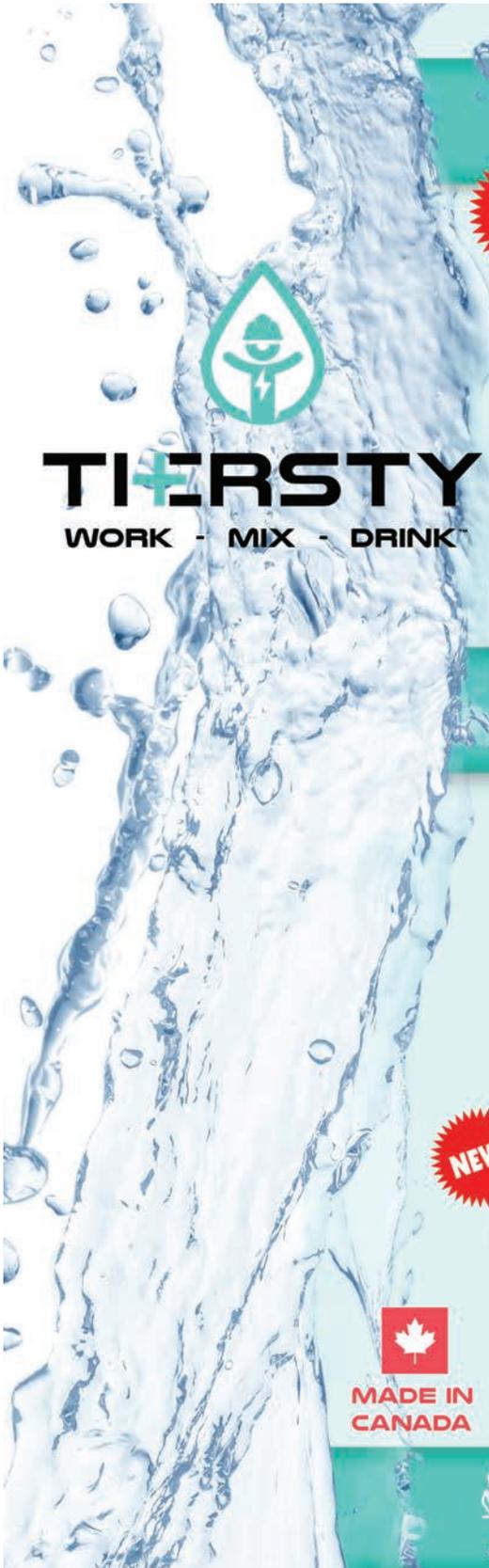


Chill-Its BPA-Free Water Bottle - 1 Litre



Chill-Its Industrial Hard Sided Cooler





**TI+ERSTY**  
WORK - MIX - DRINK™

**ALL NEW ELECTROLYTE FREEZE POPS**



**BAG1418-FRZ**  
Variety Pack

**DESCRIPTION**

18 single serve (66ml) freeze pop packs in 1 bag

**UNITS/CASE**

14 pouch bags of 18 freeze pops (252 freeze pops)

- CAFFEINE FREE
- ESSENTIAL ELECTROLYTES
- NO ARTIFICIAL COLOURS
- GLUTEN FREE
- KOSHER
- LOW CALORIE

**FORMULATED TO EXCEED OHS GUIDELINES**



<b>BAG1040-FRP</b> Fruit Punch	<b>BAG1040-ORN</b> Orange	<b>BAG1040-LEM</b> Lemonade	<b>BAG1040-RAZ</b> Blue Raspberry	<b>BAG1040-LLM</b> Lemon Lime
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**DESCRIPTION**

40 single serve stick packs in resealable stand up pouch bag

**UNITS/CASE**

10 pouch bags of 40 sticks (400 sticks)



**MADE IN CANADA**



**\*VENDING COMPATIBLE**

**BAG2010-MIX\***  
Variety Pack

**DESCRIPTION**

10 single serve stick packs in resealable stand up pouch bag

**UNITS/CASE**

20 pouch bags of 10 sticks (200 sticks)



SEA SALT



CAFFEINE FREE



SUGAR FREE



BCAA'S



ESSENTIAL ELECTROLYTES



VITAMIN C



B VITAMINS



NO ARTIFICIAL COLOURS



Thersty's mission is to create great tasting hydration products scientifically designed to meet the rigorous demands of the professional worker!

# 9. Heat Stress Program Evaluation

## 1. Assessing Effectiveness:

Employers should regularly assess the effectiveness of their heat stress prevention measures. This can be done by reviewing temperature measurements, employee well-being, and performance indicators.

## 2. Making Necessary Adjustments:

Based on the assessment of effectiveness, employers should make any necessary adjustments to their heat stress prevention measures. This may involve modifying work schedules, adjusting rest breaks, or implementing additional preventive measures.

## 3. Employee Training & Awareness:

Employers should provide their employees with training and information about the risks associated with heat stress and the preventive measures in place. This can help to ensure that employees are aware of the risks and know how to protect themselves.

## Levitt-Safety has the heat stress solutions you need.

Whether you are looking for Personal Monitoring, Area Monitoring, Cooling PPE, or Hydration solutions. Get started today by contacting us to speak to one of our Safety Specialists.



# 10. References

ACGIH® TLV/BEI Guidelines. <https://www.acgih.org/science/tlv-bei-guidelines/>

Alberta Government. (2024). Working Safely in the Heat & Cold. Retrieved from [Best practice - working safely in the heat and cold - \[Current to July 2014\] - Best practice - working safely in the heat and cold \[July 2014\] - Open Government](#)

Canadian Centre for Occupational Health & Safety. Keep Your Cool. (2014). Retrieved from [https://www.ccohs.ca/products/posters/keep\\_cool](https://www.ccohs.ca/products/posters/keep_cool)

Canadian Centre for Occupational Health & Safety. (2024). CCOHS Products & Services. Retrieved from [https://www.ccohs.ca/products/posters/heat\\_illness](https://www.ccohs.ca/products/posters/heat_illness)

Canadian Center for Occupational Health & Safety. (2024). Hot Environments. Retrieved from [https://www.ccohs.ca/oshanswers/phys\\_agents/heat/heat\\_control.html](https://www.ccohs.ca/oshanswers/phys_agents/heat/heat_control.html)

Canadian Digestive Health Foundation. (2024). The Importance of Staying Hydrated: General Hydration & Virus Recovery. Retrieved from <https://cdhf.ca/en/the-importance-of-staying-hydrated-general-hydration-and-virus-recovery/>

Ergodyne. (2025). Heat Stress Handbook. Retrieved from <https://www.ergodyne.com/sites/default/files/2023-05/heat-stress-handbook.pdf>

Erika, C. (2023). Ontario's Ministry of Labour Proposing to Introduce Heat-stress Regulations to Better Protect Workers. Retrieved from <https://www.cbc.ca/news/canada/sudbury/ontario-ministry-of-labour-heat-stress-occupational-health-and-safety-1.6930685#:~:text=The%20proposed%20regulations%20would%20require,may%20also%20lead%20to%20death>

Government of Canada. (2020). Communicating the Health Risks of Extreme Heat Events. Retrieved from <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/communicating-health-risks-extreme-heat-events-toolkit-public-health-emergency-management-officials-health-canada-2011.html#a1.3>

Government of Canada. (2023). Thermal Stress in the Workplace. Retrieved from <https://www.canada.ca/en/employment-social-development/services/health-safety/reports/thermal-stress-workplace.html>

Government of Canada. (2024). Canada Occupational Health & Safety Regulations. Retrieved from <https://laws-lois.justice.gc.ca/eng/regulations/sor-86-304/page-14.html>

Infrastructure Health & Safety Association (IHSA). (2024). Heat Stress. Retrieved from [https://www.ihsa.ca/topics\\_hazards/heat\\_stress.aspx](https://www.ihsa.ca/topics_hazards/heat_stress.aspx)

Marni, T. (2023). Protecting Workers from Heat Stress & Heat-Related Illnesses. Retrieved from <https://www.ontariocanada.com/registry/showAttachment.do?postingId=45108&attachmentId=58984#:~:text=Under%20the%20Occupational%20Health%20and,lead%20to%20heat%2Drelated%20illnesses>

Ontario. (2023). Bill 222, Heat Stress Act, 2024. Retrieved from <https://www.ola.org/en/legislative-business/bills/parliament-43/session-1/bill-222>

OHS Insider. (2024). Heat Stress Requirements – Know the Laws of Your Province. Retrieved from <https://ohsinsider.com/heat-stress-requirements-know-the-laws-of-your-province/>

PIP Premium X-Airflow™ Workwear. Retrieved from <https://ca.pipglobal.com/en/brand/bisley/products/#xairflow>

Sensidyne. (2024). LSI Heat Shield Heat Stress Monitors. Retrieved from <https://www.sensidyne.com/heatshield-heat-stress-monitor/>

SlateSafety. (2024). Connected Worker Safety. Retrieved from <https://slatesafety.com/>

Sun Safety at Work. (2016). Shade. Retrieved from [https://sunsafetyatwork.ca/sites/default/files/ssawc\\_fact\\_sheet\\_shade.pdf](https://sunsafetyatwork.ca/sites/default/files/ssawc_fact_sheet_shade.pdf)

TSI. (2024). Heat Stress Monitors. Retrieved from <https://tsi.com/products/heat-stress-monitors/>

Unifor. (2020). Heat Stress Fact Sheet. Retrieved from <https://www.unifor.org/resources/our-resources/heat-stress-fact-sheet>







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