Heat Illness Prevention in Indoor Places of Employment

(a) Scope and Application

This section applies to all indoor places of employment where the outdoor dry bulb temperature equals or exceeds 10 degrees Fahrenheit above average outdoor temperature for at least five continuous days.

Exception:

1. For indoor places of employment where the employees work indoors for less than one hour per day, the employer may comply with section 3395 in lieu of this section.
2. For indoor places of employment where the building temperature is controlled to maintain the ACGIH TLV or NOAA Level 1 Heat Index or lower using a mechanically controlled ventilation system.

(b) Definitions

"ACGIH" means the American Conference of Governmental Industrial Hygienists.

"Acclimatization" means the physiological changes that occur in response to a succession of days to exposure to heat that occurs gradually when a person is exposed to it.

"Action Limit" means the ACGIH limit, measured by Web Bulb Globe Temperature (WBGT, as defined below), for the unacclimatized worker. Appendix B shows the ACGIH Action Limit (AL)

"Cool-down area" means an area located close to the work area, isolated from heat sources, and provided with seating and a supply of cool drinking water and cups. A cool-down area does not include locations where heat in the area defeats the purpose of providing relief and allowing the body to cool, such as locations where employees are exposed to radiant heat from the sun or other sources. A cool-down area may be provided by any natural or artificial means that does not expose employees to unsafe or unhealthy conditions and that does not deter or discourage access or use.

"Dry bulb temperature" means the temperature of air measured by a thermometer freely exposed to the air without considering humidity or
radiant heat.

"Environmental risk factors for heat illness" means working conditions that create the possibility that heat illness could occur including WBGT, , workload and duration, clothing and personal protective equipment worn by employees.

"Wet Bulb Globe Temperature (WBGT)" means the temperature measured by utilizing dry air

temperature, humidity, and radiant energy used to calculate thermal load on a worker.

"Heat illness" means a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

"Heat index" means a measure of heat stress used by the National Weather Service that takes into account the dry bulb temperature and the relative humidity. Radiant heat is not included in the heat index. A chart to determine the heat index is included as Appendix A.

"TLV" means Threshold Limit Value which is the exposure to heat as measured by the Wet Bulb Globe Thermometer (WBGT) under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime without adverse health effects. Appendix B shows the ACGIH TLV.

For purposes of this section:

(1) "Level I" means a heat index considered "cautionary" as defined by National Oceanic and Atmospheric Administration (NOAA) where fatigue is possible with prolonged exposure and/or physical activity.

(2) "Level II" means a heat index that is considered "Extreme Cautionary"as defined by NOAA where heat illness such as muscle cramps, heat exhaustion, etc. with prolonged exposure and physical activity may occur. .

(3) "Level III" means a heat index that is considered "Danger" as defined by NOAA where muscle cramps, or heat exhaustion is likely

"Heat wave" means any five days in which the predicted high temperature for the five days will be at least 10 degrees Fahrenheit higher than the average high daily temperature in the preceding five days.

"High radiant heat work area" means a work area that has an indoor radiant heat source and is found in one of the following:

(1) Foundries, brick-firing and ceramic plants, glass manufacturing, vehicle and vehicle parts manufacturing, rubber manufacturing, steam plants, boiler rooms, industrial scale bakeries and confectioneries, commercial kitchens, industrial scale laundries, food canneries, chemical plants, mining sites, smelters, and steam tunnels.

Exception: In areas where the employer demonstrates that the WBGT and the work/rest regimen of the worker is within the ACGIH Action Limit or is no greater than Level 1 Heat Index, the work area is not a high radiant heat work area.

(2) Other locations that have been determined in writing by the Chief of the Division of Occupational Safety and Health to include a high radiant heat work area through the issuance of an Order to Take Special Action, in accordance with section 332.3 of these orders.

"Indoor" means a space under a ceiling or overhead covering that is bound on at least half of all sides by walls. A wall includes, but is not limited to, any door, window, retractable divider, garage door, or other physical barrier that is temporary or permanent, whether open or closed. "Indoor" includes the space inside a vehicle. All places of employment that are not indoor are considered outdoor and are covered by section 3395.

"Personal risk factors for heat illness" means factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

"Preventative cool-down rest" means a rest break taken in a cool-down area.

"Radiant heat" means heat transferred by electromagnetic waves rather than by conduction or convection.

(c) Heat Illness Prevention Plan

The employer shall establish, implement, and maintain an effective indoor heat illness prevention plan. The plan shall be in writing in both English and the language understood by the majority of the employees and shall be made available in the workplace to employees and to representatives of the Division of Occupational Safety and Health (DOSH) upon request. The plan may be included as part of the employer's Illness and Injury Prevention Program (IIPP) required by section 3203 or the employer's outdoor Heat Illness Prevention Plan required by section 3395, and shall, at a minimum, contain the following items:

(1) Effective procedures to obtain the active involvement of employees and their representatives in developing and implementing the Plan.

(2) Effective procedures to assess heat illness risk under subsection (d).

(3) Rest and hydration procedures under subsection (e).

(4) First-aid and emergency response procedures under subsection (f).

(5) Acclimatization methods and procedures under subsection (g).

(6) Control measures under subsection (h).

(7) Training program under subsection (i).

(d) Assessment of Heat Illness Risk

The employer shall assess the risk of heat illness as follows:

(1) Determine the heat index or WBGT in all locations where heat exposure is at or near the highest levels and at times when heat exposure is at or near the annual high. Personal heat monitoring is not required.

(2) Reassess heat illness risk:

(A) When there is a change in working conditions, such as a change in tasks, procedures, work processes, engineering controls, or administrative controls that may affect the exposure to heat in the work area, or when a new heat source is introduced;

(B) When there is a heat wave in which the temperatures exceed those previously assessed;

(C) When there is an incident of heat illness or when information indicates that the existing assessment of heat illness risk is deficient; and,

(D) At least annually.

(e) Rest and Hydration

All employees shall have access to water and rest as follows:

(1) Employees shall have access to potable drinking water meeting the requirements of sections 1524, 3363, and 3457, as applicable, including but not limited to the requirements that it be fresh, pure, suitably cool, and provided to employees free of charge. The water shall be located as close as practicable to the areas where employees are working. Where drinking water is not plumbed or otherwise continuously supplied, it shall be provided in sufficient quantity throughout the work shift to provide one quart per employee per hour for drinking for the entire shift. Employers may begin the shift with smaller quantities of water if they have effective procedures for replenishment during the shift as needed to allow employees to drink one quart or

more per hour. The frequent drinking of water shall be encouraged.

(2) Employees shall be allowed and encouraged to take a preventative cool-down rest when they feel the need to do so to protect themselves from overheating. Such access shall be permitted at all times. An individual employee who takes a preventative cool-down rest shall be monitored and asked if he or she is experiencing symptoms of heat illness and shall not be ordered back to work until any signs or symptoms of heat illness have abated, but in no event less than five minutes.

(f) First Aid and Emergency Response

The Employer shall establish effective first-aid and emergency response procedures for responding to signs and symptoms of possible heat illness, including but not limited to first-aid measures and how emergency medical services will be provided. The procedures shall:

(1) Ensure that effective communication by voice, observation, or electronic means is maintained so that employees can contact a supervisor or emergency services when necessary.

(2) Ensure effective observation and monitoring of employees for alertness and signs or symptoms of heat illness by implementing one or more of the following:

(A) Supervisor or designee observation of 20 or fewer employees;

(B) Mandatory buddy system;

(C) When a buddy system is not feasible, regular communication, initiated by the employer, with an employee who works alone; or

(D) Other effective means of observation.

(3) Designate one or more employees on each worksite as authorized to call for emergency medical services, and allow other employees to call for emergency services when no designated employee is available.

(4) If a supervisor observes, or any employee reports, any signs or symptoms of heat illness in any employee, the supervisor shall take immediate action commensurate with the severity of the illness.

(5) If the signs or symptoms are indicators of severe heat illness (such as, but not limited to, decreased level of consciousness, staggering, vomiting, disorientation, irrational behavior or convulsions), the employer must implement emergency response procedures.

(6) An employee exhibiting signs or symptoms of heat illness shall be monitored and shall not be left alone or sent home without being offered onsite first aid and/or being provided with emergency medical services in accordance with the employer's procedures.

(g) Acclimatization

(1) An employee who has been newly assigned to a high radiant heat work area or a new location covered by this section shall be closely observed by a supervisor or designee for the first five to 14 days of the employee's employment or new assignment, dependent on work/rest regimen.

(h) Control Measures

The employer shall conduct pre-shift meetings before the commencement of work to review the heat plan, encourage employees to drink plenty of water, and remind employees of their right to take a preventative cool-down rest when necessary. The employer shall implement additional control measures as follows:

(1) For work areas where the heat index is at Level III or the ACGIH TLV is exceeded:

(A) Engineering controls shall be implemented to reduce the heat index to Level II or Level I whenever feasible or to fall within the ACGIH TLV. When feasible engineering controls are not sufficient to reduce the heat index to Level II or Level I or below the ACGIH TLV, the employer shall use feasible engineering controls to reduce the heat index as much as possible. Engineering controls may include the isolation of hot processes or work areas, shielding of radiant heat sources, insulating hot objects, air cooling systems, air conditioning systems, and local exhaust ventilation.

(B) The employer shall encourage employees to consume water at least every 15 minutes.

(C) The employer shall ensure that employees take a preventative cool-down rest for a minimum of 10 minutes every hour.

(D) The employer shall implement additional administrative controls to reduce employees' risk of heat illness as much as feasible, including changes in employees' work location or work activity, reductions in work intensity, and reduced work speed.

(E) Personal protective equipment (PPE), such as water-cooled garments, air-cooled garments, ice-packet vests, wetted over-garments, and heat-reflective clothing, shall be made available to employees.

(2) For work areas where the heat index is at Level II:

(A) The employer shall encourage employees to consume water at least every 30 minutes.

(B) The employer shall ensure that employees take a preventative cool-down rest as needed.

(C) Personal protective equipment, such as water-cooled garments, air-cooled garments, ice-packet vests, wetted over-garments, and heat-reflective clothing, shall be made available to employees, as deemed appropriate for the work area.

(3) For work areas where the heat index is at Level I, the employer shall encourage employees to consume water at least once per hour.

(4) The rest periods required by this subsection may be provided concurrently with any other meal or rest period required by Industrial Welfare Commission Order No. 14 (8 CCR 11140) if the timing of the preventative cool-down rest period coincides with a required meal or rest period, this may result in no additional preventative cool-down rest period required in an eight-hour workday. If the workday will extend beyond eight hours, then an additional preventative cool-down rest period(s) will be required at the conclusion of the eighth hour of work; and if the workday extends beyond 10 hours, then another preventative cool-down rest period(s) will be required at the conclusion of the tenth hour and so on. For purposes of this section, a preventative cool-down rest period has the same meaning as "recovery period" in Labor Code section 226.7(a).

(i) Training

Effective training on the following topics shall be provided to each supervisory and non-supervisory employee before the employee begins work in areas covered by this section and annually thereafter:

(1) The environmental and personal risk factors for heat illness, as well as the added burden of heat load on the body caused by exertion, clothing, and personal protective equipment.

(2) The employer's procedures for complying with the requirements of this standard, including, but not limited to, the employer's heat illness prevention plan, the employer's responsibilities to use feasible engineering and administrative controls to reduce employee exposures and to provide water, personal protective equipment upon request, cool-down rests, emergency response procedures, access to first aid, and the employees' right to exercise their rights under this section shall be guaranteed without retaliation.

(3) The importance of frequent consumption of small quantities of water, up to four cups per hour (i.e., one quart), when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties.

(4) The concept, importance, and methods of acclimatization.

(5) The different types of heat illness, the common signs and symptoms of heat illness, and appropriate first aid and/or emergency responses to the different types of heat illness, and the fact that heat illness may progress quickly from mild symptoms and signs to serious and life-threatening illness.

(6) The importance of employees immediately reporting to the employer, directly or through the employee's supervisor, symptoms or signs of heat illness in themselves, or in co-workers.

(7) The employer's procedures for responding to signs or symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary.

(j) Recordkeeping

(1) Records of the most recent heat illness risk assessment and the control measures used by the employer to reduce heat illness risk shall be created and maintained.

(2) Training records shall be created and maintained for at least one year and shall include training dates, contents or a summary of the training sessions, name and qualifications of persons conducting the training, and the names and job titles of all persons attending the training sessions.

(3) All documents and measurements required by this section shall be made available to employees and their representatives at their place of employment and shall be made available to the DOSH upon request.

(4) The employer shall not prohibit a properly trained employee from recording or utilizing a calibrated device to measure atmospheric temperature and relative humidity of their work environment or accessing weather conditions from the closest weather station recognized by NOAA, National Weather Service. WBGT temperature can be calculated based on these measurements and readily available WBGT calculators found on the internet to compare the result to the ACGIH Threshold Limit Value (TLV) for thermal stress heat exposure (i.e. Table 2 of the TLV Guide).

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Appendix A (mandatory)Remove and use the NOAA Heat Index showing Caution to Danger ranges for low and normal humidity

Heat Index °F (°C)

TEMPERATURE °F (°C)	RELATIVE HUMIDITY (%)												
	40	45	50	55	60	65	70	75	80	85	90	95	100
100 (38)	109 (43)	114 (46)	118 (48)	124 (51)	129 (54)	136 (58)							
98 (37)	105 (41)	109 (43)	113 (45)	117 (47)	123 (51)	128 (53)	134 (57)						
96 (36)	101 (38)	104 (40)	108 (42)	112 (44)	116 (47)	121 (49)	126 (52)	132 (56)					
94 (34)	97 (36)	100 (38)	103 (39)	106 (41)	110 (43)	114 (46)	119 (48)	124 (51)	129 (54)	135 (57)			
92 (33)	94 (34)	96 (36)	99 (37)	101 (38)	105 (41)	108 (42)	112 (44)	116 (47)	121 (49)	126 (52)	131 (55)		
90 (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)	103 (39)	106 (41)	109 (43)	113 (45)	117 (47)	122 (50)	127 (53)	132 (56)
88 (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	98 (37)	100 (38)	103 (39)	106 (41)	110 (43)	113 (45)	117 (47)	121 (49)
86 (30)	85 (29)	87 (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)	102 (39)	105 (41)	108 (42)	112 (44)
84 (29)	83 (28)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)	90 (32)	92 (33)	94 (34)	96 (36)	98 (37)	100 (38)	103 (39)
82 (28)	81 (27)	82 (28)	83 (28)	84 (29)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)	90 (32)	91 (33)	93 (34)	95 (35)
80 (27)	80 (27)	80 (27)	81 (27)	81 (27)	82 (28)	82 (28)	83 (28)	84 (29)	84 (29)	85 (29)	86 (30)	86 (30)	87 (31)

ADD Appendix B
The ACGIH TLV/Action Limit for Heat