

## Heat Illness Prevention in Indoor Places of Employment

### (a) Scope and Application

This section applies to any indoor place of employment where the dry bulb temperature exceeds 90 degrees Fahrenheit or where employees perform moderate, heavy, or very heavy work and the dry bulb temperature exceeds 80 degrees Fahrenheit.

**Exception 1:** This section does not apply to work areas with an air-conditioned, temperature-controlled environment under either of the following conditions:

- (1) The air-conditioning system is properly functioning, the dry bulb temperature does not exceed 85 degrees Fahrenheit, and employees perform only light or moderate work.
- (2) The air-conditioning system is temporarily disabled and undergoing emergency repairs for periods that do not exceed four days per calendar year, the dry bulb temperature does not exceed 90 degrees Fahrenheit, and employees perform only light or moderate work.

**Exception 2:** For indoor places of employment where the employees work indoors for less than one hour per day and do not work in high radiant heat work areas, the employer may comply with section 3395 in lieu of this section.

### (b) Definitions

“Acclimatization” means temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to 14 days of regular work for at least two hours per day in the heat. For purposes of this section, employees who have worked at least two continuous hours per day for at least 10 days within the previous 14 days in places of work covered by this section are considered acclimatized, and all other employees are considered unacclimatized.

“Clothing-adjustment factor” means the numbers of degrees Fahrenheit to be added to the WBGT or heat index measured in an employee’s workplace based on the clothing the employee is required to wear, as shown in Table 1:

**Table 1. Clothing-Adjustment Factors**

Clothing Type	Clothing-Adjustment Factor in Degrees Fahrenheit
Long sleeve shirt and pants	0
Woven cloth coveralls	0
Double layer clothing	5
Vapor barrier coveralls	20

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

“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.

“Heat stress” means the net heat load to which an employee is exposed from the combined contributions of work activity, air temperature, humidity, air movement, radiant heat, and required clothing.

“Heavy work” is a work activity level that involves intense arm and trunk work, carrying, shoveling, manual sawing, or pushing and pulling heavy loads. An example of heavy work is walking at a fast pace.

“High radiant heat work area” means a work area with a significant radiant heat source such as found in foundries, brick-firing and ceramic plants, glass manufacturing, vehicle and vehicle parts manufacturing, rubber manufacturing, electrical utility rooms, electric power-cogeneration facilities, boiler rooms, industrial scale bakeries and confectioneries, commercial kitchens, industrial scale laundries, food canneries, chemical plants, mining sites, smelters, and steam tunnels.

“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 covered by section 3395.

“Light work” is a work activity level that involves sitting with light manual work with hands or hand and arms. Examples of light work include driving a vehicle or standing with light arm work and occasional walking.

“Moderate work” is a work activity level that involves sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. An example of moderate work is normal walking.

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

“Very heavy work” is a work activity level that involves very intense activity at fast to maximum pace.

“Wet bulb globe temperature (WBGT)” means a measure of heat stress that takes into account temperature, humidity, air velocity, and radiant heat. For indoor conditions WBGT is calculated as:

$$WBGT = 0.7NWB + 0.3GT$$

Where:

NWB = Natural Wet-Bulb Temperature  
GT = Globe Temperature

Note: This calculation is automatic on WBGT instruments and devices.

### **(c) Heat Illness Prevention Plan**

The employer shall establish, implement, and maintain an effective heat illness prevention plan (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 upon request. The Plan may be included as part of the employer's Illness and Injury Prevention Program required by section 3203 or the employer's outdoor Heat Illness Prevention Plan required by section 3395, and shall, at a minimum, contain:

- (1) Effective procedures to obtain the active involvement of employees and their representatives in developing and implementing the Plan.
- (2) Effective procedures to identify and assess heat stress hazards under subsection (d).
- (3) Rest and hydration procedures under subsection (e).
- (4) First-aid and emergency response procedures under subsection (f).
- (5) Controls measures under subsection (i).
- (6) Training programs under subsection (j).

### **(d) Identification and Assessment of Heat Stress Hazards**

- (1) In high radiant heat work areas, employers shall measure the WBGT, estimate the amount of time the employees spend in those areas, and identify the employees' work activity levels and clothing-adjustment factors.
- (2) In work areas other than high radiant heat work areas, employers shall measure the WBGT or determine the heat index, estimate the amount of time the employees spend in those areas, and identify the employees' work activity levels and clothing-adjustment factors.
- (3) The assessments of heat stress hazards required in paragraphs (d)(1) and (d)(2) shall be conducted when the heat stress is at or near the annual high. Employers shall reassess heat stress hazards 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 heat stress in the work area. The employer shall reassess heat stress hazards when information indicates that the existing assessment of heat stress hazards is deficient.

### **(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 at the beginning of 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; 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.

- (1) 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.
- (2) 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.
- (3) 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) Close Observation of Unacclimatized Employees**

- (1) An unacclimatized employee shall be closely observed by a supervisor or designee while performing work within the scope of this section.
- (2) For work areas where the indoor temperature is affected by the outdoor temperature, all employees shall be closely observed by a supervisor or designee during a heat wave. For purposes of this section only, "heat wave" means any day in which the predicted high

temperature for the day will be at least 80 degrees Fahrenheit and at least ten degrees Fahrenheit higher than the average high daily temperature in the preceding five days.

**(h) Short-Term Exposure Limits**

- (1) Subject to the provisions in subsection (i), employees performing work in high radiant heat work areas shall not be exposed over any one-hour period to any time-weighted average WBGT exceeding the values set forth in Table 2.

**Table 2. Short-Term Exposure Limits for Employees Performing Work in High Radiant Heat Work Areas**

Work Activity Levels	Sum of WBGT Values and Clothing Adjustment, in Degrees Fahrenheit	
	Acclimatized Employees	Unacclimatized Employees
Light	88	85
Moderate	82	79
Heavy or Very Heavy	80	77

- (2) Subject to the provisions in subsection (i), employees performing work in work areas other than high radiant heat work areas shall not be exposed over any one-hour period to any time-weighted average heat index exceeding the values set forth in Table 3. Employers may use WBGT measurements and Table 2 instead of Table 3.

**Table 3. Short-Term Exposure Limits for Employees Performing Work outside High Radiant Heat Work Areas**

Work Activity Levels	Sum of Heat Index and Clothing Adjustment, in Degrees Fahrenheit	
	Acclimatized Employees	Unacclimatized Employees
Light	90	87
Moderate	85	82
Heavy or Very Heavy	80	80

**(i) Control Measures**

- (1) Employers with employees performing work in high radiant heat work areas shall use engineering controls to reduce employee exposures to at or below the short-term exposure limits provided in paragraph (h)(1), to the extent feasible. Where feasible engineering controls cannot reduce exposures to at or below the short-term exposure limits provided in paragraph (h)(1), feasible engineering or administrative controls, or both, shall be used to reduce heat stress as much as possible.

- (2) Employers with employees performing work in work areas other than high radiant heat work areas shall use engineering or administrative controls, or both, to reduce employee exposures to within the short-term exposure limits provided in paragraph (h)(1) or (h)(2), to the extent feasible. Where feasible engineering and administrative controls cannot reduce exposures to within the short-term exposure limits provided in paragraph (h)(1) or (h)(2), such controls shall be used to reduce heat stress as much as possible.
- (3) Engineering controls shall include, as feasible and applicable, but shall not be limited to, the following: isolation of hot processes or work areas, shielding of radiant heat sources, insulating hot objects, and local exhaust ventilation.
- (4) Administrative controls shall include, as feasible and applicable, but shall not be limited to, the following: reduced activity levels, work-rest schedules, and cooled rest areas.
- (5) During the period necessary to install or implement engineering or administrative controls, or where the employer can demonstrate that engineering and administrative controls are not feasible to reduce employee exposures below the short-term exposure limits provided in subsection (h), the employer shall implement the following procedures:
  - (A) Ensure that effective communication by voice, observation, or electronic means is maintained so that employees can contact a supervisor when necessary.
  - (B) Ensure effective observation and monitoring of employees for alertness and signs or symptoms of heat illness, by implementing one or more of the following:
    1. Supervisor or designee observation of 20 or fewer employees.
    2. Mandatory buddy system.
    3. Regular communication with sole employee such as by radio or cellular phone.
    4. Other effective means of observation.
  - (C) Designate one or more employees on each worksite as authorized to call for emergency medical services, and allowing other employees to call for emergency services when no designated employee is available.
  - (D) Remind employees throughout the work shift to drink plenty of water.
  - (E) Conduct pre-shift meetings before the commencement of work to review the high heat procedures, encourage employees to drink plenty of water, and remind employees of their right to take a cool-down rest when necessary.
  - (F) Ensure that employees take a minimum ten-minute net preventative cool-down rest period every two hours.

- (6) 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 who are exposed in excess of the short-term exposure limits provided in subsection (h).

**(j) Training**

Effective training on the following topics shall be provided to each supervisory and non-supervisory employee before the employee begins work that should reasonably be anticipated to result in exposure to the risk of heat illness, 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 to within the short-term exposure limits provided in subsection (h) and to provide water, cool-down rests, and access to first aid, as well as the employees' right to exercise their rights under this standard without retaliation.
- (3) The importance of frequent consumption of small quantities of water, up to four cups per hour, 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 in addition, that heat illness may progress quickly from mild symptoms and signs to serious and life threatening illness.
- (6) The importance to employees of 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.

**(k) Recordkeeping**

- (1) Records of the most recent heat stress hazard identification and assessment and the control measures used by the employer to reduce heat stress 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 records required by this subsection shall be made available to employees at their place of employment and shall be made available to the Division upon request.

Appendix A (Mandatory)

Heat Index °F (°C)

		RELATIVE HUMIDITY (%)												
		40	45	50	55	60	65	70	75	80	85	90	95	100
TEMPERATURE °F (°C)	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)