



Airswift
HSE Management System
Heat Stress Program

Important Notice:

1. This procedure is a Controlled Document and shall not be amended without the authority of the Operations Manager - North America.
2. Any queries or feedback concerning the contents of this document should be addressed to the Operations Manager - North America.

Document Control - Revisions and Amendments

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The American Conference of Governmental Industrial Hygienists (ACGIH) has established TLV's for heat stress. These Threshold Limit Values refer to heat stress conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse health effects. The TLV's shown in ACGIH's Table 1 and in Figure 1 are based on the assumption that nearly all acclimatized, fully clothed workers with adequate water and salt intake should be able to function effectively under the given working conditions without exceeding a deep body temperature of 38°C or 100.4°F.

Since measurement of deep body temperature is important for monitoring the workers' heat load, the measurement of environmental factors is required which most nearly correlate with deep body temperature and other physiological responses to heat. At the present time, **Wet Bulb Globe Temperature Index (WBGT)** is the simplest and most suitable technique to measure the environmental factors. When exposure to environmental conditions is continuous for several hours or the entire work day, the WBGT shall be calculated as an hourly time-weighted-average. When the exposure is intermittent, the WBGT shall be calculated as a two-hour time-weighted-average.

All employees who are 45 years of age and older and who have not had previous occupational exposure to heat shall not be assigned to jobs where the environmental conditions equal or exceed 79°F WBGT for men and 76°F WBGT for women. All personnel who are to be assigned to hot jobs for the first time shall be evaluated by a physician prior to assignment to assure that the individual can cope with the hot environment. In the examination, special emphasis should be on the cardiovascular, renal, hepatic, endocrine and respiratory system and the skin. The worker should also be asked specific questions regarding any past heat related disorders or illness.

Medical personnel and or a clinic should be available during working hours. In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available. Supervisors will be trained in preventing heat related injuries and illnesses prior to supervising any employees. In addition, all supervisors will be trained in Swift Technical Services' and/or Client heat illness emergency response procedures.

All employees who are going to be working in a hot environment for the first time should have an acclimatization period of six days. Acclimatization to heat involves a series of physiological and psychological adjustments that occur in an individual during his first week of exposure to a hot environment. After this acclimatization process, the individual is capable of working in this type of environment without excessive strain. Some factors that may cause heat-related injuries are:

- High temperature and humidity
- Low fluid consumption
- Direct sun exposure (with no shade) or extreme heat
- Limited air movement (no breeze or wind)
- Physical exertion
- Use of bulky protective clothing and equipment
- Poor physical condition or ongoing health problems
- Some medications
- Pregnancy
- Lack of previous exposure to hot workplaces
- Previous heat-related illness

Supervisors must take into consideration personal factors prior to assigning a task that supports the opportunity for a heat injury to occur. A monitoring system is a good practice for strenuous field activities that are part of site activities in hot weather. The most effective way to carry on a monitoring system is to initiate the monitoring as soon as possible into the employees' rest period. The heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible into the rest period. If the HR exceeds 110 beats per minute, the work period should be shortened by 33% while the rest period length remains the same. If the HR is still in excess of 110 beats per minutes at the beginning of the next rest period, the work period should be shortened another 33%. This procedure should be followed until the HR is maintained below 110 beats per minute.

Body temperature should also be measured at the beginning of the rest period. If the oral temperature (OT) is above 99.6°F, the work period should be shortened by 33% while the rest period should stay the same. If, at the beginning of the next rest period, the OT still exceeds 99.6°F, the work period should be shortened another 33% while the rest period remains the same. This procedure should be continued until the beginning at rest temperature is below 99.6°F.

An additional method of monitoring the effects of heat is determining the amount of body water loss due to sweating. This is a simple procedure that requires only a scale that is accurate to 1/4 lb. The employee should be weighed in the morning before work, and then at the end of the work shift. Ideally, this weighing will be done with no clothes on, but at least the clothing should be similar at both weigh ins. If there is more than a 1.5% loss of total/body weight, the employee should be instructed to increase his daily fluid intake by the weight lost.

To acclimatize an employee, the work load should begin with 50 percent of the anticipated total work load and time exposure on the first day, followed by daily 10 percent increment increased until the 100 percent level is reached on the sixth day.

To re-acclimate an employee who has been off the job for nine or more consecutive days, the employee shall also begin at 50 percent of the anticipated total work load on the first day followed by daily 20 percent increment increases until the 100 percent level is reached on the fourth day.

Regular acclimatized employees who return from four consecutive days of illness should have medical permission to return to the job and should undergo a four day re-acclimatization period as described in the preceding paragraph.

As a means of controlling the effects of heat related injuries, the workloads will be evenly distributed over the entire workday is desirable when at all possible. Hot jobs should be routinely scheduled for the coolest part of the work shift and areas. The work area must be evaluated, and controls put in place where possible to control the environmental factors that can contribute to heat related illness. The most common environmental factors are air temperature, humidity, radiant heat sources and air circulation. All employees will be provided with access to shade and cool water. Regular breaks, consisting as a minimum of one every hour, shall be prescribed for employees to get water and replacement salt. The employer shall provide a minimum of 8 quarts of cool potable 0.1 percent

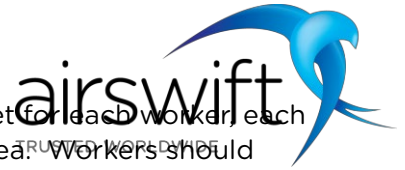
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salts, drinking water or a minimum of 8 quarts of potable water and salt tablets for each worker, each shift. This water supply should never be more than 200 feet from the work area. Workers should drink 16 ounces of water before beginning work.

All supervisors and employees who may be exposed to environmental conditions that exceed the prescribed limits shall be given training in health and safety procedures and emergency response procedures through a program that shall include the following as a minimum:

1. Information as to water intake for replacement purposes.
2. Information as to salt replacement.
3. The importance of weighing each day before and after the day's work.
4. Instruction on how to recognize the symptoms of heat disorders and illnesses including dehydration, exhaustion, prickly heat and heat stroke.
5. Information as to special caution that shall be exercised in situations where employees are exposed to toxic agents and/or other stressful physical agents which may be present in addition to and simultaneously with heat.
6. Information concerning heat acclimatization. This information should be kept on file and readily accessible to the worker at all places of employment where he may be exposed to excessive heat.

In addition, a warning sign shall be placed in any area where the environmental conditions are 86°F WBGT or above stating a warning that this area is a heat stress area.

The most common physical factors that can contribute to heat related illness are type of work, level of physical activity and duration, and clothing color, weight, and breathability.

Heat stress usually is a result of protective clothing decreasing natural body ventilation. However, heat stress may occur at any time where work is being performed at elevated temperatures.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild to fatal. Heat stress is one of the most common and potentially dangerous illnesses that affect workers using personal protective equipment.

Reactions, Symptoms & Treatments

Reactions to excessive heat are normally relatively easy to spot if one is familiar with the basic symptoms. When any heat-related symptom is present the worker will be promptly given first aid treatment. The worker should be taken to a cooler area immediately, never leave a worker with heat related symptoms alone and when in doubt follow emergency response procedures.

Heat Rash

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Heat rash is a mild irritation caused by continuous exposure to heat and humid air and aggravated by chafing clothes. The condition decreases the ability to tolerate heat.

The symptoms are a mild red rash, especially in areas of the body in contact with the protective gear. This condition can usually be eased by decreasing the amount of time in protective equipment and using powder to absorb moisture and decrease chafing.

Heat Cramps

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a condition that can lead to heat stroke.

The symptoms are acute painful spasms of voluntary muscles usually in the abdomen or the extremities.

Treatment involves removing the victim to a cool area and loosening clothing. Have the victim drink 1 to 2 cups of water immediately and every 20-minutes thereafter, until symptoms subside. Total water consumption should be 1 - 2 gallons per day.

Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by the loss of fluids from the body. This condition is much less dangerous than heat stroke, but it nonetheless must be treated.

Symptoms are a pale, clammy, moist skin, with profuse perspiration and extreme weakness. Body temperature is normal, pulse is weak and rapid breathing is shallow. The person may have a headache, may vomit and may be dizzy.

Treatment involves removing the person to a cool air-conditioned place, loosening the clothing and placing the individual in a head-low position. Bed rest is recommended.

Consult a physician, especially in severe cases. The normal thirst mechanism is not sensitive enough to ensure fluid replacement. Have the victim drink 1 to 2 cups of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be about 1 to 2 gallons per day.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress, caused by a failure of heat regulating mechanisms of the body. The individual's temperature control systems that causes sweating stops working correctly. The body temperature rises so high that brain damage and death will result if the person is not cooled quickly.



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The symptoms are red, hot, dry skin. Although the person may have been sweating profusely earlier, when heat stroke occurs, the sweating has stopped. The victim may suffer from severe nausea, dizziness, confusion, *extremely* high body temperature, rapid respiratory and pulse rate and unconsciousness, convulsions or coma in the advanced cases. Sometimes the first noticeable symptom is a staggering gait.

The treatment should begin immediately. The victim must be cooled quickly. If the body temperature is not brought down fast, permanent brain damage or death will result. Soak the victim in cool but not cold water, sponge the body with cool water or pour water on the body to reduce the temperature to a safe level (102°F). Observe the victim and obtain medical help. Do not give coffee, tea or alcoholic beverages.

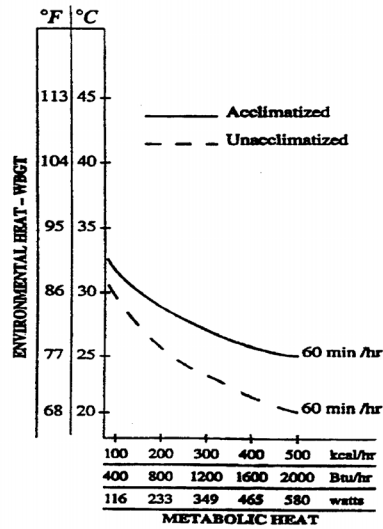
TABLE 1. Examples of Permissible Heat Exposure Threshold Limit Values (Values are given in °C and (°F) WBGT) *

Work-Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	30.0 (86)	26.7 (80)	25.0 (77)
75% Work 25% Rest, each hour	30.6 (87)	28.0 (82)	25.9 (78)
50% Work 50% Rest, each hour	31.4 (89)	29.4 (85)	27.9 (82)
25% Work 75 % Rest, each hour	32.2 (90)	31.1 (88)	30.0 (86)


*As workload increases, the heat stress impact on an un-acclimatized worker is exacerbated (see figure 1). For un-acclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.

Figure 1

Permissible Heat Exposure Threshold Limit Values For








Prevent Heat Illness at Work



Ease into Work. Nearly 3 out of 4 fatalities from heat illness happen during the first week of work.

Build a tolerance to heat by increasing intensity by 20% each day.

-  Drink cool water even if you are not thirsty
-  Rest for long enough to recover from the heat
-  Take breaks in a shady or cool area
-  Wear a hat and dress for the heat
-  Watch out for each other
-  Verbally check on workers wearing face coverings



Heat illness signs and symptoms

Watch for signs of heat illness and act quickly. When in doubt, call 911.

If a worker experiences:

Headache or nausea
Weakness or dizziness
Heavy sweating or hot, dry skin
Elevated body temperature
Thirst
Decreased urine output



Take these actions:

- > Give cool water to drink
- > Remove unnecessary clothing
- > Move to a cooler area
- > Cool with water, ice, or a fan
- > Do not leave alone
- > Seek medical care (if needed)

