

What is heat stress?

Heat stress is a variety of conditions where the body is under stress from overheating. It can include heat rash, sunburn, heat cramps, fainting, heat exhaustion and heat stroke. Heat stress can also be fatal. Six main factors are involved with heat stress at a workplace:

- ☞ temperature
- ☞ humidity
- ☞ radiant temperature of surroundings
- ☞ air movement
- ☞ clothing
- ☞ physical activity of workers

How does heat stress affect me?

Your body is always generating heat and losing it to the environment. The harder your body works, the more heat it has to lose. When the environment is hot, humid or has a source of radiant heat, your body must work harder to get rid of its heat. Heat stress can reduce work capacity and efficiency.

A person with heat stress may suffer from profuse sweating, dizziness, muscle cramps, confusion and collapse.

What occupations are at risk?

Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress in employees in such places as:



commercial kitchens, laundries, bakeries, boilers/electrical utilities.

Outdoor operations conducted in hot weather, such as construction, refining, asbestos removal, roofing, road repair, farming/agriculture and hazardous waste activities, especially those that require workers to wear non-breathing protective clothing, are likely to cause heat stress among exposed workers.

How do you prevent heat stress?



Employers and employees should consider all of the following items in order to help reduce the likelihood of heat stress:

- ⇒ Increase workers' awareness of how to recognize the symptoms of heat stress and preventive measures.
- ⇒ Employers should identify potential heat stress areas and protect workers by providing necessary control measures.
- ⇒ Cool drinking water should be accessible to workers. A cup of water every 30 minutes is recommended.
- ⇒ Use fans, ventilators, exhaust systems and air conditioning systems to control the workplace temperature.
- ⇒ Check with your doctor before working if you are taking medications.
- ⇒ Take rest breaks in cool areas.
- ⇒ Employers should either allow workers to follow a work-rest schedule or reduce their activity level during hot periods.
- ⇒ Wear clothing that is loose-fitting (if allowed), tightly woven and light-coloured in order to reflect heat rather than absorb it.

- ⇒ Outdoor workers should also know the hazards of UV radiation and effective protective measures.

Are some people more prone to heat stress?

People at a greater risk of heat stress are those who are physically unfit, suffer from heart disease, consume alcohol, are overweight, are not sufficiently acclimated, or are required to wear excessive clothing.



How should heat stress be treated?

The affected worker should rest in a cool environment and drink water. If the worker does not rapidly improve, obtain medical attention promptly.

Is there an acceptable temperature range for workers?

Working in a hot environment can be quite exhausting. In addition to individual levels of tolerance, the body's response to heat depends upon temperature, humidity, wind speed and type of work. While there are temperature range guidelines developed by ASHRAE, the calculation of worker heat stress overexposure is much more complicated for compliance purposes. The goal of heat stress monitoring is to ensure that workers' deep body temperatures do not exceed 38°C. Measurement of deep body temperature is impractical for monitoring the worker's heat



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load; therefore, the measurement of environmental factors is required which most nearly correlate with deep body temperature and other physiological responses to heat. Presently, the heat stress index (WBGT), established by the ACGIH, is the simplest and most suitable technique to measure the environmental factors.

For the purpose of heat stress compliance, section 10 of the Occupational Health and Safety regulations has adopted the ACGIH WBGT index. The WBGT index takes into consideration the natural wet-bulb temperatures and globe temperatures of the workplace. These temperatures are measured using special instruments.

Table 1 below can be used as a reference guide for assessing thermal comfort. If your workplace is outside of these ranges, some form of control measures such as increased ventilation or use of cooling units may be required. In these instances, calculation of the WBGT value may be necessary to ensure workers are not exposed above acceptable thermal limits, especially if there are sources of radiant heat or high humidity levels present.

Table 1 lists recommended values for sedentary work and are not meant to be used for compliance purposes. In most office settings, in which the temperature may exceed the ASHRAE guidelines (which relate to thermal comfort) and the environment is uncomfortable, it is still somewhat unlikely that the WBGT acceptable limit will be exceeded and thus present a health concern (unless the humidity is unusually high and/or there are significant radiant sources of heat).

TABLE 1

Summer (light slacks and short sleeve shirt)	23-25°
Winter (heavy slacks and long sleeve shirt)	20-24°

TAKEN FROM: ASHRAE Std. 55 - 1981,
Table 1 (assuming 50% relative humidity)