

H&S Guidance - Education & Leisure



RISK ASSESSMENT AND GUIDANCE: HEAT STRESS IN THE WORKPLACE

Light and/or sedentary work

Light and/or sedentary work includes sitting at a workstation (eg computer), typing, driving cars and similar road vehicles, using telephones, dealing with customers, operating a control panel, light lifting (ie 4.5 KG loads >6 lifts per min or lifting 11 KG < 3 lifts per min), walking slowly (ie <2 mph) and upright, inspecting hot processes, sewing, using tools (eg drills).

Temp (°C)	Level of risk and/or warning		Risk control measures required		
			Breaks	Drinking water (min intake)	Other risk controls
<24 °C	Trivial	Monitor	Normal	Normal	Adequate ventilation should be provided, which may be both natural (ie windows) and/or mechanical (ie fans). Heat sources, pipes and flat roofs should be insulated so as to minimize the transfer of heat into the workplace. Windows could be shaded or provided with heat reflective coatings.
24-26 °C					
26-28 °C	Low	Caution. Fatigue possible but unlikely. Heat stress and/or heat stroke possible but unlikely, although persons who are more vulnerable should take remedial action(s).	Normal	Normal	Adequate ventilation should be provided, which may be both natural (ie windows) and/or mechanical (ie fans). Heat sources, pipes and flat roofs should be insulated so as to minimize the transfer of heat into the workplace. Windows could be shaded or provided with heat reflective coatings.
28-30 °C					
30-32 °C	Moderate	Caution. Fatigue likely. Heat stress and/or heat stroke possible but unlikely, although persons who are more vulnerable should take remedial action(s).	5 mins/hr	¼ pt water/hr	Increased ventilation will probably be required, including the provision of additional fans, faster air currents and/or air conditioning units. Use of flexible working and/or work scheduling recommended. Relax any formal dress codes.
34-36 °C			10 mins/hr	½ pt water/hr	
36-38 °C	High	Danger. Fatigue highly likely. Heat stress and/or heat stroke possible, especially for those most vulnerable (eg heart condition, pregnancy).	15 mins/hr	¾ pt water/hr	Consideration should be given to avoiding the work in the hot environment, including mechanization and/or the postponement of certain jobs during spells of hot weather.
+40 °C	Extreme	Extreme danger. Heat stress and/or heat stroke likely, especially for those most vulnerable (eg heart condition, pregnancy).	Positive and/or additional risk control measures must be introduced to reduce the potentially dangerously high temperature of the workplace, including increasing ventilation, reducing humidity, removing and/or stop using heat producing appliances. If work must continue in the hot workplace, then employees must take 30 mins break every hour, and 1 pint or more of water every 30 minutes. If risks cannot be reduced to an acceptable level, the workplace should not continue to be used.		

Correction factors

1. Risk [of heat stress] is not only dependant upon temperature, but is also heavily dependant upon humidity, radiant heat (eg out in sun as opposed to in the shade), the intensity of physical work and/or exercise being undertaken, and clothing being worn by employees/persons at risk, therefore:

- a. If the work is being done with clothing which may slightly restrict perspiration (eg lightweight cotton overalls), then the risk of heat stress could be slightly increased, and the temperatures above should be adjusted by 1°C when assessing risk and defining risk control measures.
- b. If the work is being done with protective clothing which significantly restricts perspiration (eg dry suits in confined spaces, fully enclosed suit and hood), then the risk of heat stress could be increased, then the temperatures above should be adjusted by 4°C when assessing risk and defining risk control measures.
- c. If the relative humidity of the workplace is >80%, then the risk of heat stress could be increased, and the temperatures above should be adjusted by 2°C when assessing risk and defining risk control measures.
- d. If the employees are also exposed to significant amounts of radiant heat (eg full sun outdoors, exposed/non-insulated heat sources which are too hot to touch and/or flames, furnaces), then the risk of heat stress could be increased, and the 'temperatures above should be adjusted by 2°C when assessing risk and defining risk control measures.

2. Effects of heat in the workplace can include discomfort, heat rash, heat cramps, heat exhaustion and heat stroke/stress. Further information can be found below - see [symptoms and first aid](#).

3. Fainting could be dangerous to an employee operating machinery, including mobile plant, as well as those working close to other hazards (e.g. sharp knives, very hot surfaces and/or substances).

4. Peoples vulnerability to heat stress and/or stroke can vary depending upon their age, fitness levels, and medical conditions. Persons with heart conditions, obese, pregnant or with diarrhoea are more vulnerable to the effects of heat than others, and additional person-specific risk control measures will be required (eg more breaks and water).

5. High levels of humidity can dramatically affect the risks that high temperatures can present, with high levels of relative humidity increasing the risk of heatstroke and/or dehydration. Humid environments may include kitchens or laundries with inadequate ventilation, greenhouses, swimming pools and saunas. Water vapour can be effectively removed from the indoor workplace via adequate ventilation, avoided by careful planning and operational control of heat and vapour producing processes. Fans can also assist to mitigate the effects of heat and humidity, an air-conditioning units can effectively reduce both temperature and humidity.

6. A ventilation rate of not less than 17.5 Litres/Sec per sq.M of floor area and/or 30 air changes per hour is required in most kitchens. Air needs to be removed at a constant rate from cooking areas, and this is normally achieved by the installation of canopy ventilation above heat producing appliances. Clean and/or cool make-up air normally needs to be introduced to replace extracted air, with typically 85% of the total air needed introduced mechanically into the workspace.

7. Symptoms of heat stress and/or stroke can include profuse sweating, inability to concentrate, heat rash (ie tiny red blister-like red spots on skin), dark urine, muscle cramps, pale and moist skin, tingling in the fingers and/or toes, slurred speech, fainting, giddiness/nausea, rapid breathing, convulsions, loss of consciousness, and death (if not detected and treated at an early stage).

8. Employees should be trained to recognise and react to the symptoms of heat stress, including notifying their manager of concerns and/or relevant health conditions, and should not work alone in environments where the risk of heat stress/stroke is high or extreme.

9. Efforts should be made to ensure that the temperature and humidity in kitchens is controlled to below 28°C and 70% respectively. Where higher temperatures and/or risk of heat stress exist, further risk control measures will be required. Adequate ventilation can effectively control excess heat in kitchens, as well as remove smoke, fumes, carbon monoxide, moisture, and expanded air from radiant heat given off by cooking appliances.

10. All workplaces are covered by the Health and Safety at Work Act 1974 (HSW Act). This sets out the general duties that we have towards our employees and members of the public, and those duties which employees have to themselves and to each other. Although it does not mention temperature specifically, we should ensure, so far as is reasonably practicable, the health, safety and welfare at work of our employees. This includes providing a working environment that is both safe and without risk to health.

11. The main Regulations concerned with temperature and ventilation of indoor workplaces and on indoor workroom temperature are the Workplace (Health, Safety and Welfare) Regulations 1992 with accompanying Approved Code of Practice (ACOP) and guidance. These Regulations require that: (a) workplaces must be adequately ventilated (regulation 6); (b) the temperature during working hours must be reasonable (regulation 7); (c) any method of heating or cooling used should not produce dangerous or offensive fumes, gas or vapour (regulation 7); and (d) thermometers should be provided in the workplace to measure temperatures (regulation 7). These Regulations do not apply to outdoor workplaces.

12. The Workplace Regulations do not specify a minimum or maximum indoor workplace temperature. The Approved Code of Practice does, however, recommend, the following:

- Minimum temperatures for workrooms of at least 16°C, or 13°C if much of the work involves ,severe physical effort. These minimum temperatures do not apply to rooms or parts of rooms where it would be impractical to maintain these temperatures, eg in rooms which have to be kept open to the outside or where food or other products have to be kept cold.

- Where a reasonably comfortable temperature cannot be achieved throughout a workroom, local heating or cooling should be provided.
- If, despite local heating or cooling, employees are still exposed to uncomfortable temperatures, employers should take further action to resolve the problem.

13. No maximum temperature is set in regulation because:

- This would be prescriptive and would limit the discretion of both duty holders and enforcers. Most modern health and safety law is goal-setting - setting out what must be achieved, not how it must be done. This approach enables HSE and Local Authority inspectors to use discretion and to make sensible judgements about the extent of risks and the efforts made to counter them.
- Many workplaces have extreme temperatures because of the nature of the industry and the processes involved eg cast metal, catering and food processing; or because of the nature of the work activity, eg physically demanding work.
- Being reasonably comfortable in an indoor workplace is not a question of air temperature alone. Other issues to be considered include environmental factors and those which affect individuals, such as their age, sex and state of health. Sometimes the best that employers may be able to achieve is a thermal environment which will satisfy the majority of those working in that environment.

This doesn't mean, however, that it is safe and/or healthy for employees to work in excessive temperatures and/or work places where there is a high risk of heat stress.

14. Adequate supplies of clean potable drinking water must be freely available to employees. This water should be preferably be supplied via a tap, and be cool. Peripatetic workers may need to be provided with plastic bottles, or similar receptacles, to carry water with them, particularly if they don't have ready access to water on their travels.

If you have any queries or would like to discuss specific work situations please contact the H&S Section on 01443 864865.

Symptoms and first aid

Adults/children have different levels of tolerance for hot weather. Therefore, it's sometimes hard to predict when they may have trouble with heat stress. By knowing the symptoms ahead of time, you can properly treat their conditions as they occur.

- ❖ **Heat Rash.** Also known as prickly heat. Occurs when people are constantly exposed to hot and humid air, causing a rash that can substantially reduce the ability to sweat. Heat rash is not just a nuisance because of discomfort, but by reducing the ability to sweat, the ability to tolerate heat is reduced. Treatment should include cleansing of the affected area thoroughly and drying completely. Calamine or other soothing lotion may help relieve the discomfort.
- ❖ **Heat Cramps.** Performing strenuous physical work in a hot environment can cause heat cramps. These are painful spasms that usually are in the legs or abdomen. These cramps are caused by an electrolyte imbalance from sweating, which can result in too little or too much salt. Excess salt can build up in the body if water is not replenished. Therefore, it's important to drink plenty of water in hot weather. Heat cramps can be treated by applying firm pressure on the cramping muscles or gently massage them to relieve the spasm. Give the person sips of water, but if nausea occurs, discontinue use.
- ❖ **Heat Exhaustion.** The symptoms of heat exhaustion include heavy sweating and weakness/fatigue. Heat exhaustion often occurs when the body's core temperature rises to high levels (38-40°C). Skin tends to be cold, pale and clammy. Fainting and vomiting also may occur. The condition responds readily to prompt treatment but should not be ignored. Fainting would be dangerous to an employee operating machinery, including mobile plant, as well as those working close to other hazards not promptly treated. Employees suffering, or suspected or suffering from heat exhaustion, should seek shade if working outdoors, lie down in a well ventilated and/or air-conditioned room and drink sips of water. If vomiting occurs and continues, seek immediate medical attention.
- ❖ **Heat Stroke.** Heat stroke is a medical emergency. A heat stroke occurs when the body's core temperature rises to critical levels (41°C or higher). Primary symptoms may include confusion; irrational behaviour; possible unconsciousness; convulsion; lack of sweating; hot, dry skin (ie >36°C); and a rapid, strong pulse. If you suspect an employee is suffering from heat stroke, summon emergency medical assistance immediately because the condition can be fatal. While waiting for help, have the person lie down in a cool area and elevate his or her feet. You can help reduce body temperature by wetting the worker's skin with a cold sponge. Remove clothing, and use fans or air conditioners. An employee who is suspected of having a heat stroke should not be sent home or left unattended until a physician has approved the order.