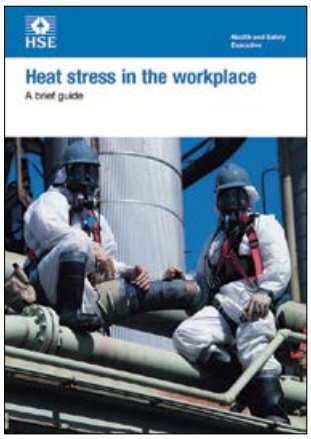
Heat stress in the workplace

A brief guide



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This leaflet describes what you, as an employer, may need to do to protect your employees from heat stress in the workplace. It will also be useful to employees and their safety representatives.

It tells you about the risks to the body from overheating when working in hot conditions (such as bakeries, compressed air tunnels, foundries and smelting operations) and gives practical guidance on how to avoid it. It does not address issues of thermal comfort in the workplace.

If you need more information on workplace temperature management than is provided here then visit our web pages on heat stress risk assessment (www.hse.gov.uk/temperature/heatstress/riskassessment.htm) and heat stress measurement (www.hse.gov.uk/temperature/heatstress/index.htm).

In many jobs heat stress is an issue all year round but this information also applies during the hot summer months where there may be an increased risk of heat stress for some people.

You and your employees must be aware of how to work safely in heat, the factors that can lead to heat stress, and how to reduce the risk of it occurring.

What is heat stress?

Heat stress occurs when the body's means of controlling its internal temperature starts to fail. Air temperature, work rate, humidity and work clothing are all factors which can cause heat stress. **It may not be obvious to someone passing through the workplace that there is a risk of heat stress.**

How does the body react to heat?

The body reacts to heat by increasing the blood flow to the skin's surface and by sweating. This cools the body as heat is carried to the surface from within by the increased blood flow and sweat evaporates. Heat can also be lost by radiation and convection from the body's surface.

Typical example of a heat stress situation

Someone wearing protective clothing and performing heavy work in hot and humid conditions could be at risk of heat stress because:

- Sweat evaporation is restricted by the type of clothing and the humidity of the environment.
- Heat will be produced within the body due to the work rate and if insufficient heat is lost deep body temperature will rise.
- As deep body temperature rises the body reacts by increasing the amount of sweat produced, which may lead to dehydration.
- Heart rate also increases which puts additional strain on the body.
- If the body is gaining more heat than it can lose then the deep body temperature will continue to rise. Eventually it reaches a point where the body's control mechanisms start to fail.

The symptoms will get worse the longer someone remains working in the same conditions.

What are the effects of heat stress?

Heat stress can affect individuals in different ways and some people are more susceptible to it than others.

Typical symptoms are:

- an inability to concentrate;
- muscle cramps;
- heat rash;
- severe thirst – a late symptom of heat stress;
- fainting;
- heat exhaustion – fatigue, giddiness, nausea, headache, moist skin;
- heat stroke – hot dry skin, confusion, convulsions and eventual loss of consciousness. This is the most severe disorder and can result in death if not detected at an early stage.

Where does heat stress occur?

Examples of workplaces where people might suffer from heat stress because of the hot environment created by the process or restricted spaces are:

- glass and rubber manufacturing plants;
- mines;
- compressed air tunnels;
- conventional and nuclear power stations;
- foundries and smelting operations;
- brick-firing and ceramics plants;
- boiler rooms;
- bakeries and kitchens;
- laundries.

In these industries working in the heat may be the norm. For others it will be encountered less often depending on the type of work being done and changes in the working environment, eg seasonal changes in outside air temperature can contribute significantly to heat stress.

What do I need to do about heat stress?

Over time people can adapt to hot conditions by sweating more and changing their behaviour to try and cool down, eg removing clothing, taking cool drinks, fanning themselves, sitting in the shade or a cool area, and/or reducing their work rate. However, in many work situations such changes may not be possible, eg when protective clothing has to be worn.

Where there is a possibility of heat stress occurring you will need to consider this when carrying out your risk assessment.

What do I need to look at in the risk assessment?

When carrying out your risk assessment, the major factors you need to consider are:

- work rate – the harder someone works the more body heat they generate;
- working climate – this includes air temperature, humidity, air movement and effects of working near a heat source;
- worker's clothing and respiratory protective equipment – may mean that sweating and other means of the body regulating its temperature are less effective;
- worker's age, build and medical factors – may affect an individual's tolerance.

Firstly, talk to the workers involved and their safety representatives (if there are any in your workplace) to see whether they are suffering early signs of heat stress. If there is a problem, you may need to get help from others who are more experienced in determining the risk from hot environments, eg occupational hygienists or occupational health professionals.

How can I reduce the risks?

Remove or reduce the sources of heat where possible:

- **Control the temperature** using engineering solutions, eg change the processes, use fans or air conditioning, use physical barriers that reduce exposure to radiant heat.
- **Provide mechanical aids** where possible to reduce the work rate.
- Regulate the length of exposure to hot environments by:
  - allowing workers to enter only when the temperature is below a set level or at cooler times of the day;
  - issuing permits to work that specify how long your workers should work in situations where there is a risk;
  - providing periodic rest breaks and rest facilities in cooler conditions.
- **Prevent dehydration**. Working in a hot environment causes sweating which helps keep people cool but means losing vital water that must be replaced. Provide cool water in the workplace and encourage workers to drink it frequently in small amounts before, during (where possible) and after working.
- **Provide personal protective equipment**. Specialised personal protective clothing is available which can incorporate personal cooling systems or breathable fabrics. The use of some protective clothing or respiratory protective equipment may increase the risk of heat stress.
- **Provide training** for your workers, especially new and young employees, telling them about the risks of heat stress associated with their work, what symptoms to look out for, safe working practices and emergency procedures.
- **Allow workers to acclimatise** to their environment and identify which workers are acclimatised or assessed as fit to work in hot conditions.
- **Identify employees who are more susceptible** to heat stress because of an illness, condition or medication that may contribute to the early onset of heat stress, eg pregnant women or those with heart conditions. You may need advice from an occupational health professional.

- **Monitor the health of workers at risk**. Where a residual risk remains after implementing as many control measures as practicable, you may need to monitor the health of workers exposed to the risk. You should then seek advice from an occupational health professional.

Further reading

To find out more see: www.hse.gov.uk/temperature/furtherinfo.htm

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

This leaflet is available at: www.hse.gov.uk/pubns/indg451.htm.