

Heat Stress

What is heat stress?

In South Australia hot work and hot workplaces are common, especially in summer. Heat may come from hot climatic conditions, heavy work in moderately hot conditions, hot work processes and work where heavy protective clothing must be worn.

What factors contribute to heat stress?

Factors that contribute to heat stress are those which produce heat and affect the body's ability to disperse excess heat and maintain normal body temperature. These are:

- The work rate - the heavier the work, the greater the amount of metabolic heat produced.
- Air temperature - the higher the air temperature, the harder it is for the body to disperse metabolic heat and maintain body temperature by sweating.
- Humidity - the higher the humidity the lower the sweat evaporation rate.
- Air flow - the lower the rate of air flow (or wind speed) the lower the rate of sweat evaporation.
- Clothing - heavy or protective clothing reduces heat dispersion by trapping the heat within the clothing. This reduces the airflow, preventing evaporation of sweat and therefore dispersal of body heat.
- Radiant heat - eg from furnaces, stage lighting, boilers.

Where can hot work and hot workplaces be found?

There are many examples where hot work and hot workplaces are found, especially in summer when environmental temperatures add to the heat load. These include:

- Foundries, smelters and metal works;
- Mines, mineral exploration sites;
- Fire fighting; confined space work;
- Outdoor work in warmer weather, eg gardeners, construction workers, road workers;
- Heavy work in warm weather, eg crash repair workshops, delivery drivers;
- Heavy work in warm weather combined with hot workplaces, eg bakeries, asbestos removal work, hazardous waste clean up.

What are the health effects of heat stress?

These vary from mild to severe:

Mild heat illness

Those affected feel weak or dizzy. Symptoms respond well to rest in a cool place, frequent drinks of non-alcoholic fluid and removal of any heavy clothing.

Heat exhaustion

This results in collapse of the affected person due to dehydration and overloaded cardiovascular system. Symptoms include fainting, lethargy, headache, low blood pressure, nausea, clammy, pale or flushed skin and a normal to slightly elevated body temperature (>39°C). Treatment includes removal of any heavy clothing, rest in a cool place and frequent drinks to replace fluid.



Heat stroke

This is a very serious condition that can result in death or permanent injury from brain damage. Signs of heat stroke include:

- Irritability;
- Confusion, disorientation;
- Incoherent speech;
- Hot, dry flushed skin;
- Convulsions;
- Loss of consciousness;
- Body temperature > 40°C;
- Cardiac arrest.

Immediate first aid must be given, while awaiting transfer to hospital. It is essential to cool the person affected by removing heavy clothing, moving to a cool place, sponging with water and vigorous fanning.

How should heat hazards be managed?

Where the potential for heat stress exists in hot workplaces, or where hot work is carried out, the following process will assist management of the hazard.

1 Development of a policy and safe work procedures

This should include a process for development of systems for identification, assessment and control of heat stress hazards; providing supervisors and employees with information and training; consultation with employees; analysis of incident and claims data; providing the necessary support for exposed workers and ensuring evaluation of the procedures and systems developed.

2 Consultation

The knowledge and experience of employees working in hot conditions is valuable and they should be involved in the development of the heat hazard control policy and procedures.

3 Information and training

As the consequences of heat stress can be so severe as to cause death, employees and their managers need to be aware of the different health effects of heat stress, the contributing factors, the need for acclimatisation, the importance of rest breaks and fluid replacement, the system for reporting and the prevention strategies which are in place. This information needs to be provided at all levels of the organisation.

4 Hazard identification and assessment

Hot environments can be identified and assessed in a number of ways. Utilising employees' knowledge, taking environmental measurements and considering the nature of the work tasks and the level of exertion needed may be sufficient. For more complex situations an occupational hygienist may be required to assist with the process.



5 Risk Control

All possible control measures need to be listed and considered.

Examples include:

- Provision of plentiful and easily accessible cool water;
- Provision of appropriate clothing for the job;
- Provision of cool, easily accessible rest areas;
- Administrative measures such as:
 - Rescheduling hot work to cooler parts of the day;
 - Rotating staff through hot areas to reduce exposure;
 - Not working in hot winds;
 - Encouraging workers to rest and have a drink if they feel unwell;
 - Acclimatisation of new employees or employees returning after a break;
- Training supervisors to observe employees for signs of heat stress;
- Encouraging employees to maintain their health and fitness.

Evaluation

The heat stress policy and procedures need to be widely promoted to all in the workplace.

They also need to be regularly reviewed and evaluated in consultation with employees, and refined as necessary.



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