

## Thermal Comfort

An area is said to have achieved thermal comfort when a person wearing a normal amount of clothing feels neither too cold nor too warm. Thermal comfort contributes both to personal well being and to productivity. Indoors, thermal comfort is dependent on air temperature, relative humidity and air movement.

Radiant heat can also affect thermal comfort, the most notable contributor being direct sunlight, which can be a significant factor for outdoor work or sports activities.

If the air temperature is too warm, occupants will feel tired, while if it is too cold, they will have difficulty in concentrating, becoming restless and easily distracted.

Low relative humidity may cause drying of the mucous membranes and lead to respiratory problems while high relative humidity can make the area feel stuffy. High relative humidity indoors can also contribute to the growth of bacteria and mould.

Some indoor air movement is desirable, so long as the air movement is not so rapid as to cause a distraction or to be perceived as a draft.

Even small deviations from the thermal comfort zone may be uncomfortable and affect performance. Employees who already feel that they are under other forms of stress will be less tolerant of thermal conditions they feel are uncomfortable.

Saint Mary's University has established ventilation guidelines based on international standards for office and related buildings. Although there are requirements for the provision of fresh air to all occupied spaces, it is important to note that there is no requirement for office or related buildings to be air conditioned. Where buildings do have air conditioning systems, Saint Mary's University also has design guidelines for these systems. Buildings which do not have either central air supply or air conditioning systems must have windows that can be opened by the occupants to provide fresh air and air movement.

If any time, you believe your physical health and safety is being affected by the workplace environment or task you are performing, contact your direct supervisor immediately.

In the absence of discernable air movement and with relative humidity in the range of 50%, air temperature becomes the critical factor in for maintaining indoor thermal comfort. However, the preferred temperature varies considerably between individuals and there is no single temperature that will satisfy everyone. Some persons may have to modify their clothing or use a fan to create conditions which they find more comfortable. In hot summer weather, achieving conditions of comfort may not be possible. If the dry bulb temperature is below 35°C and the relative humidity is less than 70%, fans may help.

## **Heat Stress**

Simply feeling hot or sweaty does not mean that a person is suffering from heat stress. It may just mean that they are uncomfortable. Heat stress is more serious and happens when normal responses to heat, such as sweating, become overloaded.

Body temperature must remain constant for the human body to work well, with normal body temperature being 37°C. The body normally regulates its temperature very well, but when it cannot manage extreme heat problems will result, especially in persons who are not used to such conditions. Heat stress occurs when a person's core body temperature rises beyond normal. This can be as a result of very hot temperatures or from physical activity which adds heat generated internally from the muscle activity.

Environmental conditions which reduce the effectiveness of sweating, which is the body's principle mechanism for getting rid of excess heat, such as high relative humidity, can make the situation worse. Therefore, heat stress guidelines generally consider both the air temperature and the relative humidity of the air.

For persons who are exposed to high temperatures or high physical activity over a number of days, the body adapts to the heat stress by becoming more efficient at heat loss. Such persons are said to have become acclimatized to the heat.

Saint Mary's University has established Heat Stress Guidelines based on those established by national and international bodies, and include evaluation of both air temperature and relative humidity. The guidelines adopted by Saint Mary's University are designed to keep the body's core temperature from rising above 38°C for a non-acclimatized person and 38.5°C for an acclimatized person. Below these levels most persons will not experience heat stress.

For further information on heat stress topics, please see the Saint Mary's University OHS Site at <http://www.smu.ca/administration/ohs/>:

- Saint Mary's Heat Stress Guidelines Policy
- Occupational Health and Safety: Heat Stress Alert Notice
- Occupational Health and Safety: Indoor Heat Stress Warning Notice
- Occupational Health and Safety: Outdoor Heat Stress Warning Notice
- Occupational Health and Safety: Health Effects of Heat Stress
- Occupational Health and Safety: First Aid Treatment of Heat Stress