

Hot Working Conditions

Spring and summer's warm weather is good news for people who have been cooped up indoors all winter and want a chance to bask in the sun. Because many Yukoners are not acclimatized, the beginning of a heat wave brings many calls to the OH&S office concerning the maximum temperatures in which people are allowed to work.

The Occupational Health Regulations deal with temperatures causing heat stress which can be a serious illness. The regulations do not address the comfort zone temperatures people prefer. It is unlikely that conditions in an office environment would reach heat stress levels as identified in the regulations. Heat stress conditions are possible, however, for people working in kitchens, dish washing, steaming or doing hard labour in moist conditions when the outside air is 30 degrees C.

The type of heat and the heat sources (sun, steam, radiant or convective) must be considered when controlling the risks. Other factors include health and physical condition, ventilation and weather. Training, engineering and administrative controls such as working hours to avoid the midday heat, can be used to cover the hazards and factors above.

Training should be the basis for any program. The need for workers to drink plenty of liquid during the day to replace the fluid they lose in perspiration should be emphasized. If it is very hot and dry, workers may not notice perspiration evaporating. If workers must continue to do heavy work, the load should be reduced to say, 50% of the activity the first day with an increase of 10% work load each day until back to full production.

Another commonly used administrative control is switching work start time to a cooler part of the day. In the Yukon, 3:00 to 6:00 pm is the usually the hottest part of the day. If a worksite cannot be cooled during the heat peak to comfort

levels, starting work at 6:00 am may be an option. Taking frequent breaks in a cooler room and allowing the body heat to dissipate is another control.

Portable fans work but only to 95 degrees F or 35 degrees C. After that, the hot air adds to the temperature instead of decreasing it. As well, venetian blinds on windows to prevent solar heat gain is an important control.

Salt pills and athletic drinks are not recommended. Once workers acclimatize, the salt is conserved in the body.

Water and other fluids should be cool, but not ice cold. Workers should drink water every 15 minutes. They should not wait until they are thirsty.

Heat Stress Disorders

The body produces heat as it generates energy. Unless this heat can be lost, it will build up and cause the body's internal (core) temperature to rise from its "normal" 37 degrees C (98.6 degrees F) until, at 40 degrees C (104 degrees F) serious illness (heat stroke) will result. Evaporating sweat cools the body and keeps the internal temperature normal. The rate of evaporation is affected by environmental factors such as humidity (the higher the humidity the less the sweat evaporates) and air flow (the greater the air flow, the greater the evaporation). If the surrounding air temperature is less than normal body temperature, the body will lose heat directly to it. However, if the air is at a greater temperature than the body, heat will be absorbed through the skin and greater demands will be placed upon the sweat system. Radiating heat can add to the load.

Heat Exhaustion

If the body sweats too much, dehydration and salt loss will result which, in turn, will produce heat cramps and heat exhaustion. A person feels tired, weak, dizzy and has clammy skin. The pulse is weak and slow, the complexion pale or flushed.

Heat Stroke

When the sweat system fails to maintain a heat balance (i.e., heat gain exceeds heat loss) core temperature rises. This results in heat stroke. Usually, a victim stops perspiring. Temperature is high (40 degrees C - 43 degrees C), skin is hot and dry, the person is confused and may have fits or lose consciousness. This is an emergency. The victim must be taken to hospital immediately.

Measuring the Risk of Heat Stress

Thermometer readings alone cannot determine the risks of heat stress disorders. Factors such as air temperature, humidity, air flow and radiant heat must be taken into account. To accomplish this, an index known as the Wet Bulb Globe Temperature (WBGT) has been developed. This uses readings provided by several instruments, plus some simple calculations, to arrive at a risk index. A single instrument known as a *Botsball* may also be used and its readings converted to WBGT figures. In general, either WBGT or Botsball indices are substantially below simple thermometer readings. For example, a 26.1 degrees C (79 degrees F) WBGT index could be roughly equivalent to an outdoor temperature of 35 degrees C (95 degrees F) in the sun or 36.7 degrees C (98 degrees F) in the shade.

Guidelines for Protection

For occasional instances of working in high heat stress risk conditions, work practices and administrative controls should be applied. The following must be applied where workers are required to work under hot conditions:

- Provide rest breaks every hour as recommended in the table below;
- Provide adequate supplies of drinking water near the work site. Workers should be strongly encouraged to frequently drink water or other cool (but not cold) fluids,

such as fruit juice, in small amounts. One cup of fluid every 15-20 minutes would provide a replacement for water lost in sweat. The feeling of thirst alone may not be enough to ensure sufficient intake of fluids;

- Train workers and supervisors in how to recognize heat stress disorders and take precautions; and
- Ensure that first aiders at the work site are well acquainted in recognizing and treating heat stress disorders.

Offices and Retail Outlets

For offices, retail outlets and other workplaces where heat conditions may cause discomfort and fatigue, but not serious illness, a *Sling Psychrometer* can be used to provide heat-humidity readings as a measure of comfort.