

ADVICE TO MEMBERS: HEALTH AND SAFETY

UPPER TEMPERATURE LIMITS

BACKGROUND

Association policy sets the lowest temperature acceptable for classroom teaching at 10 degrees centigrade.

Most people are comfortable between temperatures of 16 and 24 degrees and all efforts should be made to maintain temperatures within this range. However, experience in 1998 of unusually high temperatures (anticipated to reoccur in 1999 and beyond) led to requests for formal guidance from PPTA on what was a suitable maximum temperature for teaching.

A maximum limit is not a straightforward measure partly because of the difficulty in determining when conditions become unsafe at higher temperatures. There is a difference between what is tolerable, but permits little effective learning, and what is physically intolerable for individuals.

A single temperature measurement cannot be a definitive guide as it is at lower limits because the body can cope with relatively high temperatures provided that its cooling mechanism is able to function sufficiently to remove excess heat and maintain internal temperature below the level which generates physiological stress. This requires the rate of heat generation to be lower than the rate of heat loss, which in turn depends on four things:

- the rate of heat production in the body,
- the temperature of the surrounding air,
- radiant heat absorption,
- the rate of evaporation from the skin.

This means that at the upper limit the body is affected by the external temperature, level of activity, humidity, degree of direct exposure to the sun, and level of fluid intake.

GUIDANCE TO MEMBERS¹

Branches are advised to apply use the Heat Stress Index as a guide. This is a formula which produces a number that represents the combined effect of the air temperature, radiant heat and the humidity. The reference chart attached can be used.

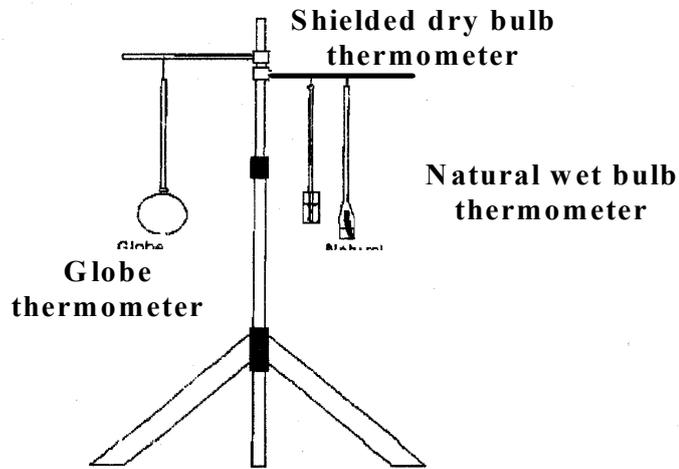
It is suggested that a HSI of 29 is a reasonable maximum for satisfactory working environments with low levels of physical activity and adequate fluid intake. Above HSI 29 a percentage of an unacclimatised population goes into heat stress (faints, gets dizzy etc). Where staff and students have been exposed to high temperatures consistently for a period of two weeks add one to each of the values indicated (eg HSI 29 is replaced by HSI 30).

Members are reminded that they are legally entitled to take industrial action when their health and safety is demonstrably at risk. It is assumed, however, that the board will be concerned about the health of both staff and students and branches should work with the board to establish a sensible upper temperature response into the board's health and safety policies before a situation arises when it may be needed.

¹ The advice given is adapted for schools from the OSH publication '*Workplace Exposure Standards*' and described by OSH Occupational Hygienist David Appelby as "sound guidance".

MEASURING HSI

A simple WBGT sensor array



The following apparatus is needed to find the HSI.

Component Details

Component	Scale	Accuracy	Notes	Measurement
Static Wet bulb thermometer	5-40°C	+/- 0.5°C		tnw
Dry Bulb thermometer	10-60°C	+/- 1°C	Must be protected from radiant heat sources.	td
Black bulb globe thermometer	20-120°C	+/- 0.5°C	50 to 150 mm matt black copper sphere with a temperature sensor or thermometer at centre. For use when there is exposure to direct sunlight. Can be omitted when the room is shaded from direct sunlight.	tg

Electronic sensors can be used to replace these components if they are calibrated to produce similar readings. The array should be placed at waist height. Measurements at different points in a room may be needed if part of the room is in direct sunlight and part is shaded.

Heat Stress Index Reference Table

For individuals who are; Sitting: light manual work, drawing, sewing, hand and arm and leg work (eg driving, operating a treddle).
Standing: drilling, milling small parts, casual walking.

Condition	Exposed to direct sunlight	Not exposed to direct sunlight
HSI	$0.7tnw + 0.2 tg + 0.1 td$	$0.7tnw + 0.3 tg$
27	<p>At HSI 27 the management can be informed that the environmental conditions need to be regularly monitored, that steps need to be taken to reduce or stabilise the HSI, and that teachers will avoid student-based physical activities as part of their lessons. Staff will have to be notified that students are to be monitored to ensure that their fluid intake is adequate. Staff will have to make professional judgements about whether teaching and learning can occur effectively and may need to modify their programme to accommodate for poor concentration/motivation.</p>	
28	<p>At HSI 28 management can be told that any further deterioration could result in teachers refusing to teach classes - teaching activity will stop and they may seek to have classes are transferred to other venues. Management should seek ways to reduce the HSI.</p>	
29	<p>At this point it is a significant health and safety issue. At any point above HSI29 staff and students are in danger. A proportion of them will be in heat stress and some people can be expected to start fainting etc. Consequently staff can indicate that, if conditions cannot be improved, then the school can be closed or their class (if conditions are localised) transferred to an alternative environment.</p>	

Example. If the wet bulb thermometer reads 26 degrees (tnw), the dry bulb reads 30 degrees (td) and the globe reading is 32 degrees(tg) then the HSI is

$$0.7*26 + 0.2* 30+0.1*32 = 27.4 \text{ "Management can be informed", etc.}$$

In a shaded room, without the globe thermometer reading, the HSI would be

$$0.7*26 + 0.3*30 = 27.2 \quad \text{"Management can be informed", etc.}$$