

Factors to help mitigate overheating

- Ensure that manual low level vents are opened: Single sided ventilation with both high and low vents opened provides over 4 times the air flow compared to having only the high level vents opened where air flow is driven by natural buoyancy alone.¹
- Ensure that blinds are drawn to reduce solar gains (ensure that east facing rooms have their blinds drawn in the evening to reduce the solar gains from early morning sun)
- Temporarily propping doors open will allow cross ventilation which can provide greater air flow if there is a breeze, dependent upon local fire safety restrictions.
- Night cooling strategy can be utilised, but care must be taken as allowing air that is too cool (below the dew point) into a space can result in condensation
- Ensure computers, screens, small appliances etc are turned off when not in use to reduce heat gains.

Above 25 °C, CIBSE Guide A suggests the following recommendations to aid adaption to the conditions in an office, (the advice can be transferred to other buildings where the majority of occupants are undertaking sedentary work):

- relaxation of formal office dress to encourage individual adaptation to conditions
- individual control over the thermal environment where practicable, such as by opening windows
- using blinds or moving out of sunny areas
- flexible working so people can work at more comfortable times of the day
- availability of hot or cold drinks
- increased air movement; e.g. the cooling effect of local fans can be equivalent to reducing the operative temperature by around 2°C.

Additionally moving to a space that is more resilient to overheating can also help alleviate discomfort.

¹ Based on a top opening with a height of 500mm and a height difference of 1.5m between the centre point of the lower and upper vents, using CIBSE AM10 calculations.

Overheating

Assessing Overheating

CIBSE (The Chartered Institute of Building Services Engineers) has recently published a report (TM52 The Limits of Thermal Comfort – Avoiding Overheating in European Buildings) which focuses on the problems of assessing overheating:

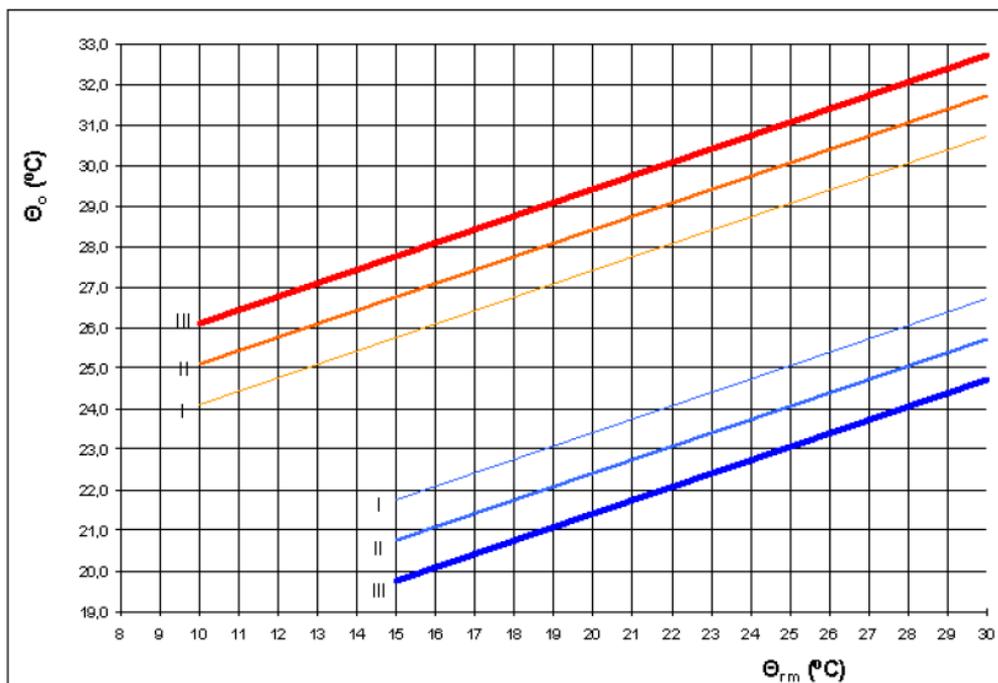
Problems with a single temperature overheating limit: In the 2006 edition of CIBSE Guide A (CIBSE, 2006), the definition of an overheating building was one in which the temperature exceeded 28°C for more than 1 per cent of working hours. Yet [adaptive comfort] suggests that this temperature might be considered acceptable in a warm UK summer. There are problems with the use of such a fixed, nationwide (or even international) threshold temperature and an 'hours over' criterion.

Indeed the use of a single temperature threshold for school design is also under review as the draft Priority Schools Output Specification is also focussing on adaptive comfort.

Adaptive Comfort

For free running naturally ventilated buildings, research has demonstrated that occupants are more tolerant to warmer internal conditions if the prevailing external conditions are also warmer. This adaptive approach to thermal comfort has formed the basis of the European Standard BSEN15251 (2007) which has been designed to underpin the Energy Performance of Buildings Directive (EPBD), which seeks to reduce energy use in the European building stock. With regard to summertime thermal comfort the approach of adaptive comfort rather than a threshold temperature, reduces the reliance of energy intensive mechanical cooling for buildings.

The standard defines 'acceptability' corridors of operative temperature based upon a running mean of the previous daily average external temperature of the preceding 7 days.



There are four categories of applicability that are described thus:

Category	Explanation
I	High level of expectation and is recommended for spaces occupied by very sensitive and fragile persons with special requirements like handicapped, sick, very young children and elderly persons
II	Normal level of expectation and should be used for new buildings and renovations
III	An acceptable, moderate level of expectation and may be used for existing buildings
IV	Values outside the criteria for the above categories. This category should only be accepted for a limited part of the year

Temperatures falling within category IV can still be accepted, but only for a limited part of the year. It is important not to assume a building is failing if category IV is hit, until a full summers worth of data has been acquired. That said, should temperatures fall consistently in category IV then a problem is likely.

Results from temperature recordings taken at Lancaster House demonstrate that the internal temperature conditions during occupied hours are mainly falling in Comfort corridor I and II, thus indicating that despite the current hot weather the internal conditions recorded in Lancaster house are of a normal to high level of expectation for such prevailing conditions. Notwithstanding this, the temperatures are often exceeding 26°C and so care should be taken to reduce heat gains and maintain individual thermal comfort.

