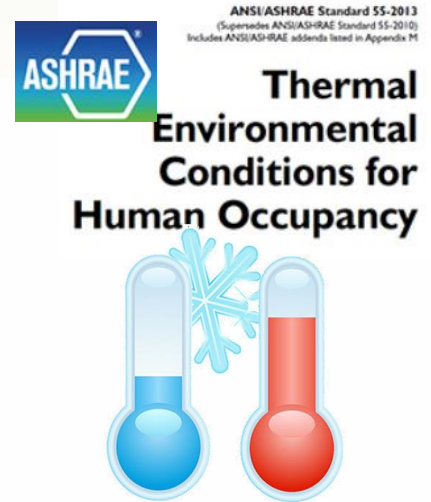


## HVAC – Indoor Temperature Setpoints

HVAC systems control the indoor temperature in a conditioned space to establish occupant thermal comfort and good indoor air quality. Thermal comfort is however more complex than just air temperature and humidity, it is also dependent on the mean radiant temperature of surrounding surfaces, occupant metabolic rate, air velocity and clothing. Some building standards often specify indoor temperatures of offices to be controlled in the range of 20-24°C. However, ASHRAE Standard 55 is a modern, scientific approach that specifies 'adaptive temperature control'. It recommends slightly reduced indoor temperatures in the winter and higher indoor temperatures in the summer, because of the human ability to adapt to the seasonal climate. Less aggressive indoor temperature settings can result in a large potential to improve thermal comfort alongside energy efficiency.



### Recommendations

- ❑ More conservative temperature settings will reduce heating and cooling energy. The closer the indoor temperature to the outdoor temperature, the more energy will be saved.
- ❑ International standards from ASHRAE or CIBSE provide guidelines for indoor temperatures of different space types. Generally if people are more active, their metabolic rate is higher, and they will be comfortable at lower temperatures.
  - ❑ Typical for offices with sedentary: 20-24 °C
  - ❑ Transient zones: 19-25 °C for example
- ❑ Applying generic temperatures ranges to all spaces may result in overcooling or overheating of some spaces at certain times. In this case energy is wasted and thermal comfort is not achieved.
- ❑ Consider designing according to ASHRAE Standard 55 for adaptive seasonal control.
  - ❑ a naturally ventilated building in Cape Town will be comfortable between 19-27 °C.
- ❑ Be aware that thermal comfort is subjective and therefore not all occupants will have the same experience.
- ❑ HVAC zoning is critical with regards to controlling zone temperatures. Separate individual temperature controls are highly recommended.
- ❑ Contact [Ecolution](http://www.ecolution.co.za) for more details.

### Savings and Benefits

- ❑ Minimal investment for large possible improvement.
- ❑ Improve energy efficiency of HVAC systems by more effective control.
- ❑ Improves occupant thermal comfort.
- ❑ Adaptive temperature control optimises the HVAC design.
- ❑ As an estimate, each degree the thermostat is raised above 21 °C (winter) implies an unnecessary waste of energy of up to 6-8%. Each degree below 25 °C (summer) implies an overconsumption of around 6-8%.

Environmental Improvement	High
Awareness Impact	High
Capital	Low
Payback	N/A