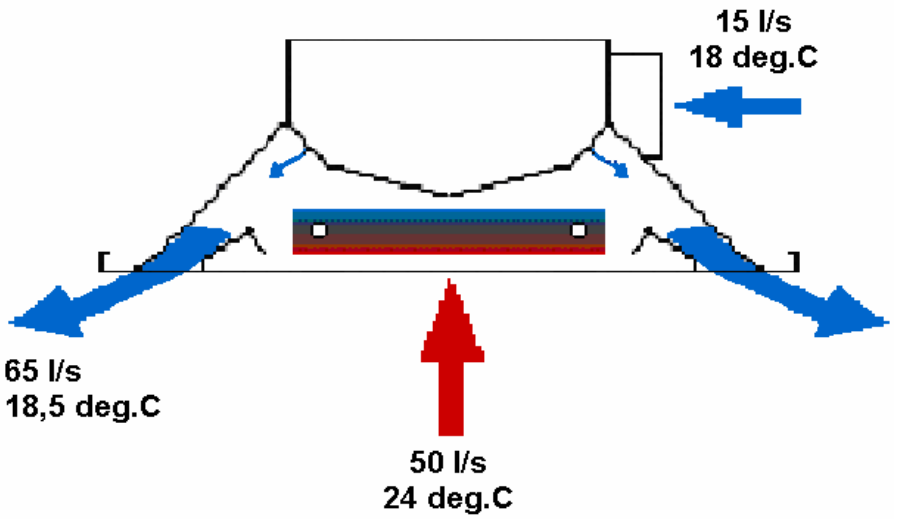
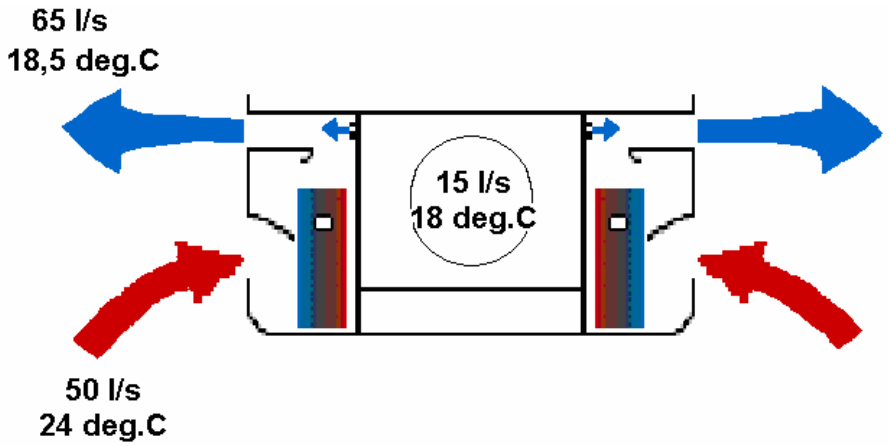
Hospital Ward Comfort Cooling, Heating and Ventilation with Active Chilled Beam

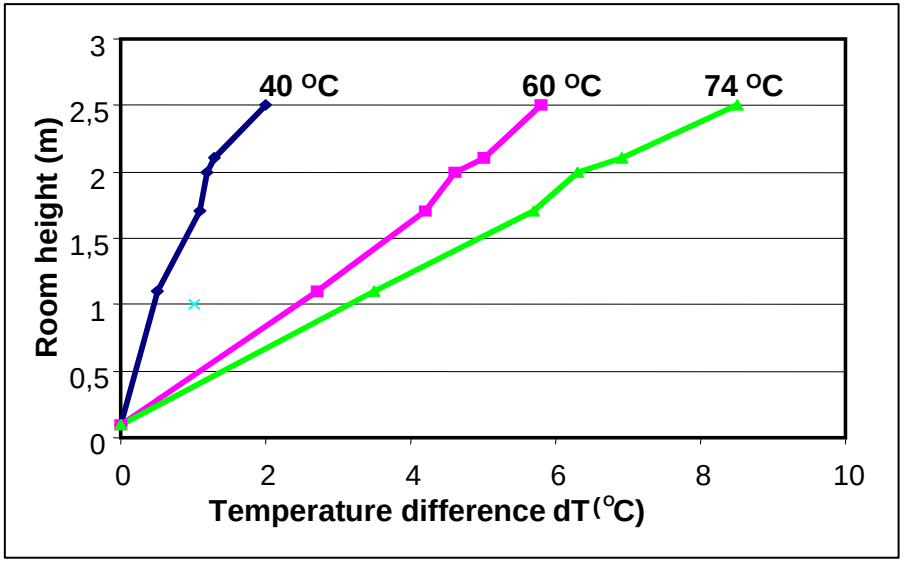
Active Chilled Beam

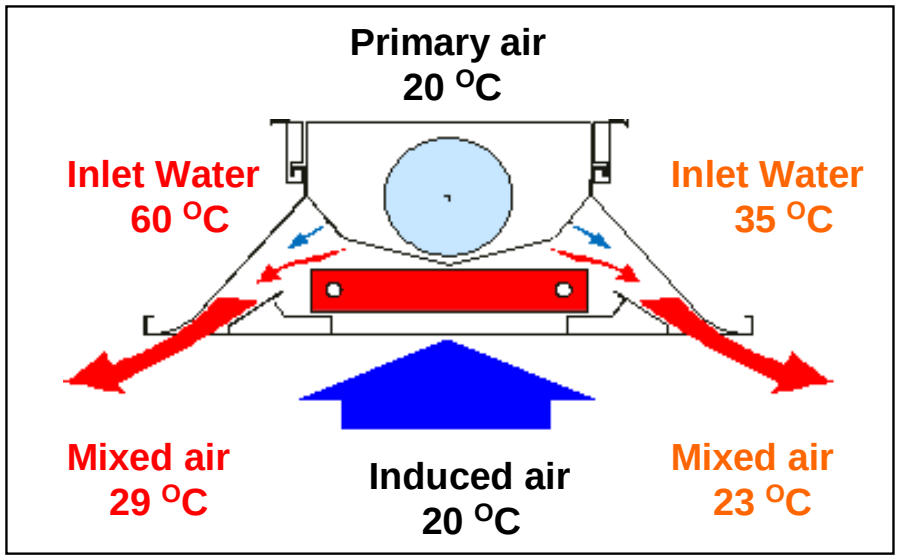
- Active beams contain a supply air plenum making heat transfer more effective due to forced convection. Primary air is supplied directly into the plenum where it exits via nozzles along its length. Air leaving the nozzles induces room air through the heat exchanger.
- The mixture of supply air and induced air is introduced into the room through the longitudinal slots along both sides of the beam. With greater heat transfer between the secondary room air and the heat exchanger active beams are better suited to spaces with higher loads than static beams. Depending on requirements, available space and beam positioning, it is possible to supply air in one or two directions. The active chilled beam operation is based on induction. The induction rate varies between 1:3 and 1:5 depending on the model





Heating with Active Chilled Beams





- 4-pipe connection
- Low inlet water temperature
- Low temperature gradient within occupied zone

Patient (Ward) Rooms:

- **Challenges / Trends:**
- Infection Control
- Hygienic, Cleanable environment
- NO LATENT COOLING!
- Isolation
- Increased need for Personal Comfort & Accelerated healing
- Increased need for Indoor Climate control
- Privacy -> # of patients in one room decreasing
- Cosy , peaceful environment (Low noise)
- **Indoor Climate Solutions:**
- Cooled Beams with Temperature & Velocity Control (HVC) enabling airflow pattern control within room

Ventilated Chilled Beams

Advantages

- Sensible cooling duties of up to 150W/m²
- Comparable installed cost to chilled water fan coil (FCU) - approx £150/m²
- Low noise operation
- Low energy running costs (typically 15-20% less than equivalent FCU system)
- Virtually ZERO maintenance
- Sensible cooling - NO condensate pumps, drainage system, rodding points
- No electrical supply
- Uncomplicated design
- Minimal ceiling void required
- Comfortable environment:
- -LOW velocities (typically less than 0.25m/s in cooling)
- -Small temperature gradient between room DB and beam leaving air temperature: typically 4-6ºC cooling mode, 2-4ºC heating mode

  -Uniform temperature distribution throughout space
- Convective LTHW Heating available – Condensing Boiler suitable
- Can incorporate fully recessed CAT2 downlighting and uplighting to satisfaction of LG3, smoke detectors, PA speakers and sprinkler systems

Sandwell Hospital – Emergency Assessment Ward

Sandwell Hospital: Resuscitation Ward

Sandwell Hospital: Patient Ward

Charlerloi Nursery, Belgium

University College London Hospital