TASK AIR
Environmental information sheet

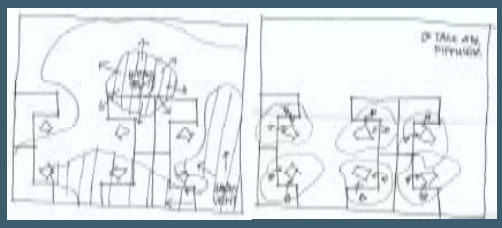

Figure 1: Task Air compared to normal air conditioning vents.

Introduction

Task Air is UCI's most significant achievement in Eco Design and Eco Innovation in 2006. The development of this concept and product sought to specifically address several concerns in commercial buildings including Indoor Environment Quality, energy consumption and Occupant Satisfaction.

Task Air delivers a designated amount of fresh air direct to the breathing zone of the workstation user, direct through the workstation screening system. Each person has personal control over the direction and volume of air in their work space using adjustable diffusers.

The Need

Air Conditioning is the number one accomodation complaint in most offices. Individuals are either too hot or too cold. This is not the fault of incorrectly configured air conditioning, rather the variables between individuals. Different weight and metabolism, varying degrees of physical fitness and activity, together with variations in levels of radiant heat from the sun, equipment and lights, place individuals at differing comfort levels. We also dress differently and drink varying amounts of liquid.

To date the only control for the office worker is to alter the thermostat and this affects everyone equally, causing further discomfort to individuals.

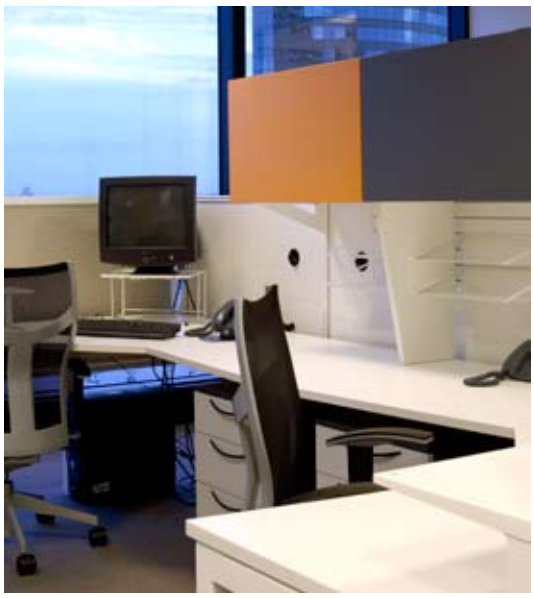

Figure 2: Task Air fit-out at Moore Stephens, Riparian Plaza, Qld

The Solution

Task Air was created to improve the health, comfort level and therefore the productivity of all office workers. Built into the UCI Task Air panel system, conditioned air is delivered direct to the breathing zone of the office worker. Further, the user can individually alter the direction and volume of the air or turn the diffuser off, to suit their current comfort requirement. With Task Air, office workers can take control of their own personal space and create their own comfort zones without negative impacts on their colleagues.

Aesthetically, Task Air has minimal impact on an office fit out. Air is delivered via the same ceiling to desk blade wall traditionally delivering power and data services, then travels through the screen and out through the diffusers near the office worker.

The only visible sign of Task Air are the diffusers set into the screen. Task Air can be used in a wide variety of workstation layouts and configurations.

UCI Eco Design targets

-Optimising Indoor Environment Quality
-Healthier workplace;
-Concepts of adaptive comfort and thermal comfort by providing individual controls to allow users to tailor the environmental conditions of their working space.

Task Air Modelling

A computational fluid dynamics (CFD) model was built to compare a conventional variable air volume (VAV) system with an identical Task Air conditioning system.

The task system modelled provides 10l/s per diffuser and each occupant is provided two diffusers.

Colour scales used in each model have identical range such that the colours represent the same values in all corresponding images.
(The CFD modeller who built these models is a senior HVAC engineer with 13 years experience, with 6 years experience in CFD modelling.) (1)

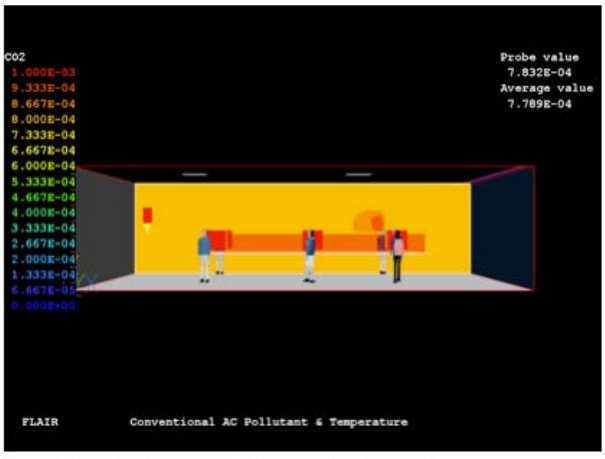

Figure 3: Carbon Dioxide levels approximating 780ppm in VAV office.

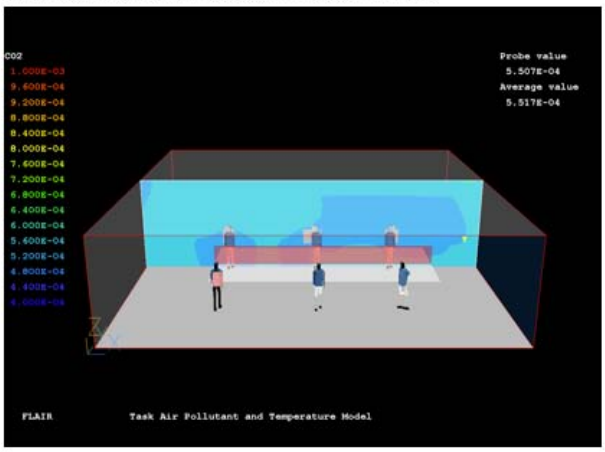

Figure 4: Carbon Dioxide levels approximating 550ppm in breathing zone with UCI Task Air.

The main difference between these two images is that the VAV air is well-mixed whilst the task air quality is localised.

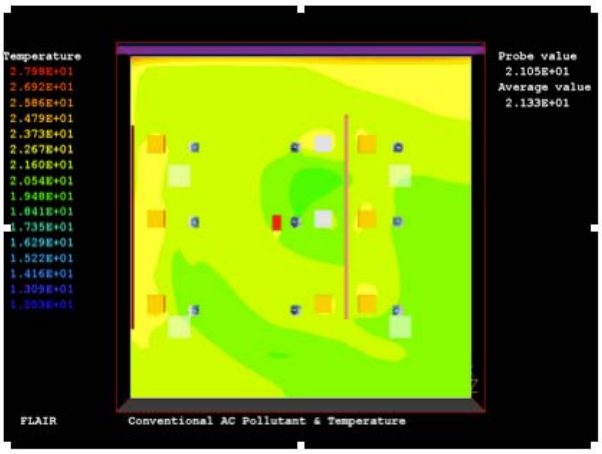

Figure 5: Temperature distribution in VAV office.

Figure 6: Temperature distribution for UCI Task Air conditioning.

The main difference in these images is that the VAV system has minor differences in air temperature that can lead to the "thermostat wars". In the Task Air conditioning simulation, the air is localised and controllable.

Note also that in order to provide the comfort at the occupant level, the VAV is providing a space that has a 0.90C lower average air temperature. ***This lower space temperature consumes additional energy.***

1. "Why Consider Task Air?" By Robert Lord, senior HVAC engineer, Lincolne Scott Pty Ltd.

Health – Indoor Air Quality

"IEQ is important because people spend around 90% of their time indoors."(2)

"Minimising the toxicity of their indoor environment is therefore a priority, particularly when indoor air is shown to be more toxic than outdoor air." (3)

"One of the important effects of task air is that the air at the breathing level has not yet been contaminated by extensive mixing with room air contaminated by people and equipment. If task air is combined with displacement ventilation for ambient air and with good filtration, the best possible interior air quality is achieved" (4)

The Benefits

UCI's Task Air was developed as part of UCI's on-going research into environmental design and the changing workplace. The increasing recognition of the coordination between comfort and productivity was a critical element of the design phase.

Individual control was also identified as an important aspect and resulted in a system that allows for personal management of the quantity and direction of air flow that is independent of the environment of colleagues.

"There is a clear and significant relationship between the ventilation air flow rate in an office and the perceived air quality, sick building syndrome symptoms and productivity" (5)

"The overall performance of office tasks is estimated to increase by 1.9% for every two-fold increase in ventilation rate at constant pollution load" (6)

"The US EPA estimates annual economic loss (in the US) due to poor IAQ at several tens of millions of dollars" (7)

---

2. Wargocki, P., Wyon, D.P., Baik, Y.K., Clausen, G. and Fanger, P.O. (1999) Perceived air quality, Sick Building Syndrome (SBS) symptoms and productivity in an office with two different pollution loads. Indoor Air, p 9, 165-179 and Fisk, W.J. and Rosenfeld, A.H. (1997), 'Estimates of Improved Productivity and Health from Better Indoor Environments', Indoor Air, vol.7 (3) pp. 158-172
3. Patrick K (2004) 'IEQ: Coming To A Building Near You', Property Australia, Property Council of Australia: Sydney, p.8.
4. ASHRAE. 2003. System Performance Evaluation and Design Guidelines for Displacement Ventilation. Atlanta: American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.
5. Hanssen, 2000
6. Fanger, 1999
7. NSW Standing Committee on Public Works Report, Sick Building Syndrome, 2001)

Case Study 1: Moore Stephens

Building Type	New
Location	Riparian Plaza, Brisbane, Qld
Client	Moore Stephens
Architect	Archibett Architecture
Design Team led by	Walter Betten
UCI supplied	Task Air Workstations

Client Overview

Part of a global network of 316 independent member firms in 93 countries, Moore Stephens Australia is a top-ten network of six local, independent member firms of business advisors and chartered accountants in all mainland capital cities with annual revenues in excess of $90 million.

Brisbane designer, Walter Betten of Achibett Architecture embraced UCI Task Air technology into his innovative design for this fit out. Moore Stephens staff are able to directly control the air quality in their personal spaces.

Figure 7: Fit-out featuring UCI Task Air at Moore Stephens, Riparian Plaza.

"We wanted to make a fresh start at Riparian Plaza and give our staff the very best environment in which to work,"
Mr Kevin Blinco, Moore Stephens Brisbane's Managing Partner

Printed on stock sourced from sustainable forestry using soy bean oil based inks

Investment

Task Air can reduce investment in office accomodation. During the fit out process this is achieved through the trade off between the Task Air system that replaces elements of traditional air conditioning equipment. This investment reduction is further achieved during the operating phase of the office by reducing reconfiguration costs and ongoing energy costs.

Most importantly, the return/ investment ratio is improved through productivity gains.

"A vast amount of material has been written about the increased productivity due to better air quality and personally adjustable controls. Since 90% of the cost of buildings are the occupants, even a very small increase in productivity will pay for more than the cost of the building, including operating cost and amortization"
(Hans F. Levy, PE Argon Corporation Life Member ASHRAE)

The Installation

Installation of Task Air is easy as it has all the demountable and reconfigurable features of modern workstation systems.

Installation of the Task Air workstation is simplified by use of UCI's conversion box in the ceiling and connecting Task Air to conventional flexible air conditioning ducts.

Correct volumes of air directed to each cluster of workstations is established by the mechanical engineer during installation. This ensures optimal volumes are delivered to each individual. General temperature control, air volumes and pressures are all controlled in a conventional manner.

UCI Task Air installation is fully reversible back to conventional ceiling delivery at the end of a tenancy.

Environmental Considerations

-Correctly configured UCI Task Air can reduce the overall volume of air required, resulting in less hardware and less energy required to condition air.
-Ambient effectiveness.
–Focussed conditioned air into the breathing zone, where it is primarily needed, and less air in ambient areas, means less wastage of high-energy conditioned air.
-Individual workstation zones can be switched off when not in use, resulting in less energy use, eg. out of hours.

Green Star

Task Air helps companies work toward Green Star (the Green Building Council of Australia's rating system for buildings) ratings in many ways. Task Air can contribute toward Green Star credits because it specifically addresses Indoor Environment Quality (IEQ) by allowing individual control of air supply through each workstation. Additionally, Task Air is easily disassembled and can be offered with product stewardship. Because each project is unique, UCI will work with customers individually to assist with Green Star applications.

"up to 3 points are awarded where 90% of workstations enable individual control" Green Star Office Interiors V1.1 IEQ 8

Contact Information

For further information, please contact us on:
1300 824 824 or national@uci.com.au