

Air Extraction & Replacement

Fume cupboards

Fume cupboards are like giant extractor fans in a large cupboard in which vaporous chemicals and other harmful airborne substances are handled.

The laboratories house 11 fume cupboards, each of which has variable speed drive fans and controls. The maximum air extraction rate for each fume cupboard is 450 litres/sec although normal usage is in the vicinity of 250 litres /sec.

(The fume cupboards are manufactured in Hamilton by Calibre Plastics)



Replacement air

Air that is extracted by the fume cupboards must be replaced with outside air ('make-up' air). Managing the make-up air is the greatest usage of energy in the mechanical systems throughout the building. To optimise energy demands and provide fresh, comfortable conditions in offices and laboratories, we chose a centralised tempered air system (with ducted distribution system) using two rooftop ECO-AIR units. One caters for the offices and laboratories in the northern wing of the building whereas the second unit supplies the collection spaces and facilities in the southern wing. Between them, the ECO-AIR units supply 6000 litres of make-up air. This not only exceeds the code for outdoor air requirements but also matches the air change rates required for an air-conditioning system.

The ECO-AIR units incorporate

- a heat exchanger through which air from some of the fume cupboards passes before being discharged
- a hot gas bypass system for reheating and dehumidifying air if needed
- microprocessor controlled energy management
- ozone friendly (zero depletion) refrigerant.

(The ECO-AIR units are manufactured in Australia.)

