

## Removal of Formaldehyde from a Dissection Lab without Added Energy Consumption



Arguably, formaldehyde can be considered to be one of the most prevalent contaminants present in laboratory air. Its use is widespread in most laboratories in North America, notwithstanding the fact that it is a confirmed carcinogen and well-known irritant. Prolonged exposure to formaldehyde can cause hypersensitivity. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends 1 ppm (1.5 mg/m<sup>3</sup>) as a time-weighted average (TWA) for occupational exposure during an 8-hour period.

The University of Ottawa had a specific problem related to formaldehyde removal. The Gendron Hall Building, located on the university's campus, housed a dissection room that was measured to exceed the TWA as set by the ACGIH for formaldehyde. The main activities in the biology lab were dissection of specimens for learning purposes in undergraduate studies.

### Superior Air Quality at Minimal Cost

Traditionally, dilution ventilation techniques would be used to reduce the steady-state concentration of most gases emitted within a laboratory space. Laboratories of this type are generally maintained under negative pressure, and the

### *Gendron Hall at the University of Ottawa*

combination of lab exhaust hoods with make-up air is used to control the migration of contaminants to other spaces within the building.

The dissection room at Gendron Hall however, had a problem controlling the amount of formaldehyde vapour that was emitting into the lab space. This vapour along with some other organics were exfiltrating into other parts of the building, causing discomfort for the occupants of the adjacent offices. Moreover, the measured TWA within the laboratory space itself was not acceptable so as to ensure exposure safety for the students and/or professors.

The engineers involved with this project had two options pertaining to the implementation of a solution. The first was to increase the total lab exhaust rate and proportionally increase the amount of make-up air that would be provided to the space. The retrofit requirements for this option would be to replace existing exhaust and air-handling equipment so as to accommodate the new

## Circul-Aire A.P.S.-3000 Air Purification System



increased air flow. Subsequently, a dramatic increase in energy consumption would exist as a result of pre-heating of the additional make-up air.

The second option was deemed to be not only more energy efficient, but would also provide superior control of air quality within the laboratory space.

## Recirculation and Filtration to Reduce Costly Outdoor Air Requirements

Circul-Aire's engineers utilized their APS-3000 design in combination with potassium permanganate media to recirculate lab air within the space, thus completely removing the existence of formaldehyde vapour, while significantly reducing the energy requirement that would normally be associated with traditional ventilation techniques.

The APS-3000 system incorporated a pre-filter with an average efficiency of 30%, two chemical media stages of MM-1000 (potassium permanganate) for a total of 600 lb., a 30% efficiency after-filter and as a final stage for particulate removal a 90% efficiency filter was incorporated into the system.

Circul-Aire's APS-3000 system in combination with a source capture hood system would be used to provide exceptional filtration for approximately 12 to 16 months use, without requiring media replacement.

## TECH-CHEK Service for Maintenance Monitoring

The maintenance of the A.P.S.-3000 Air Purification System has also been simplified with the TECH-CHEK Service supplied by Circul-Aire. With this exclusive service, media samples are tested in order to verify consumption rates.

This lifetime service is monitored by a computerized program from Circul-Aire that indicates the appropriate schedule for media replacement.

This customized service, supplied at no additional charge, not only provides a precise maintenance schedule, but also ensures the highest performance of the A.P.S.-3000 Air Purification System installed at the University of Ottawa.



**Source Capture Hood System attached to A.P.S.-3000**

FOR MORE INFORMATION ON A SPECIFIC APPLICATION, PLEASE CONTACT YOUR LOCAL REPRESENTATIVE OR CIRCUL-AIRE.

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