

1. PURPOSE

This guidance has been prepared to provide information about the safe use of fume cupboards at the University of Melbourne. While much of it will also be relevant to the use of recirculating laminar flow or biohazard cupboards, specialist advice should be sought for their use.

2. REFERENCES

- *Occupational Health and Safety Act 2004* (Vic)
- AS 2243.8: Safety in laboratories. Part 8. Fume cupboards

3. RESPONSIBILITIES

3.1. Laboratory, managers, department managers and supervisors

Laboratory managers, department managers and/or supervisors responsible for the use and maintenance of fume cupboards should:

- ensure that all staff using ducted fume cupboards receive training and information on safe use;
- ensure that associated procedures and guidelines are followed by staff or students using ducted fume cupboards;
- ensure that fume cupboards that do not meet airflow requirements are removed from service using an Out of service tag; and
- ensure a [Health & Safety: Fume cupboard clearance](#) for inspection, maintenance and repairs form is completed prior to maintenance work on a fume cupboard commences.

Local areas should ensure that exhaust fume discharges do not contain contaminants in excess of the levels specified by the appropriate regulatory authority. It is recommended the discharge level be set below the recommended occupational exposure standard level.

3.2. Campus Services

Campus Services undertake the following activities related to ducted fume cupboards:

- ensure ducted fume cupboards are tested according to AS 2243.8 twice yearly;
- ensure that test results are forwarded to the responsible person in the local area as soon as possible; and
- ensure that the test results are recorded on the fume cupboard in a visible location as soon as possible after testing (see Figure 1).

LABORATORY SYSTEMS GROUP PTY.LTD.		NATA ACCREDITED TESTING LABORATORY REGISTRATION No. 4043		SAFETY SMART PTY.LTD. Unit 6, 144-150 Canterbury Road KILSYTH VIC 3137 TEL: (613) 8720 9000 FAX: (613) 9761 7350			
TEST DATE	FC NUMBER	REPORT #	SMOKE TEST AS/NZS 2243.8 AS/NZS 2243.9	FACE VELOCITY AS/NZS 2243.8 AS/NZS 2243.9	OVERALL SYSTEM TEST *	TECHNICIAN NAME	NEXT TEST DATE
29-7-15	FC3	77551	PASS	0.54	REFER REBOLT	I-CARTER	29-1-16

* This item is not covered by NATA Accreditation.

Figure 1: Example of fume cupboard test results

3.3. Employees

Employees using fume cupboards should:

- ensure that all procedures and guidelines are followed when using ducted fume cupboards.
- before using a fume cupboard for the first time:
 - ensure the fume cupboard twice yearly testing is current.
 - locate where the fan failure warning alarm is and what it will sound like.
 - locate the fire damper or emergency stop (if fitted) for use in the event of a fire; and
 - locate the nearest phone, fire extinguisher/blanket, shower, and eyewash station, and be familiar with the local area emergency procedures; and
- regularly maintain the fume cupboard by:
 - removing the contents of the cupboard and washing the walls and work bench.
 - keeping sinks and drains clear of refuse and checking them regularly.
 - labelling all containers in the fume hood appropriately; and
 - ensuring waste bottles in the fume hood are capped when not in use and are disposed of regularly.

4. GUIDELINES

4.1. Fume cupboard function and usage

A fume cupboard is essentially a ventilated box with one side being moveable to provide an adjustable opening. It provides air extraction to remove any fumes produced within the box. It is designed to have laminar flow through the front opening, i.e., the flow is to be even and non-turbulent through the open face of the cupboard.

To obtain even flow through the face of the fume cupboards baffles are generally installed at the back of the cupboard. These baffles are set to extract the air from two or more locations across the back of the fume cupboard. If the openings provided by the baffles are blocked by items stored in the cupboard, then the air low through the face of the cupboard can become uneven.

Whenever anything is placed within the fume cupboard it introduces turbulence into the cupboard which may affect the containment and extraction of fumes. If a fume cupboard is not set up and used appropriately, fumes may escape out of the sash opening of the fume cupboard towards the user, especially with heavier vapours such as formaldehyde or chlorinated solvents.

Fume cupboards draw air out of the rooms they are installed in. Therefore, there needs to be an adequate volume of air available, or the fume cupboard will not be able to draw a sufficient volume of air to function properly.

Where the room is small or there are a large number of fume cupboards an additional supply of air, other than the normal room ventilation, may be required. This additional air is known as the make-up air.

If the make-up air supply is not adequate or the make-up air is switched off then a fume cupboard may not be able to achieve the required face velocity. Alternatively, if there is no make-up air and the room ventilation is switched off, there may be insufficient air volumes for the fume cupboards to achieve the required face velocity.

Incoming air can be deflected off an item placed in the fume cupboard at enough speed to escape from the back into the room. A person standing in front of the fume cupboard increases the probability of fumes entering the lab.

The base of the fume cupboard must be kept clear to allow effective ventilation of the work area.

The use of the screen will result in turbulence directly behind the screen. If the area behind the work area is not kept clear there is a high potential for a 'dead spot' to be created which will increase the potential for fumes to escape.

4.2. Considerations for standard operating procedures

When producing standard operating procedures (SOP) the following points should be considered and where applicable included in the procedure.

1. Ensure that a work/item is at least 10 cm from the leading edge of the fume cupboard. The larger the item, the further back it needs to be within the fume cupboard to overcome turbulence.
2. Ensure items are not stored in the fume cupboard. This is particularly important where a perspex screen or lead bricks are used for radioisotope work.
3. Minimise the number of items stored within the fume cupboard.
4. Ensure items placed in the fume cupboard, do not block the baffles, and produce regions of zero or low flow. This is particularly relevant with larger items (eg ovens).
5. Minimise traffic past the front of the fume cupboard as this can cause turbulence.
6. Use fume cupboards with a non-porous bench surface for work with radioactive material.
7. Ensure windows that may create draught in the vicinity of the fume cupboard are closed.
8. Ensure doors within one meter of a fume cupboard are kept closed during the use of fume cupboard.
9. Where applicable, ensure the make-up air supply and room ventilation are on whenever the fume cupboard is in use.

For further information, contact your local [Health and Safety Business Partner](#).