

OBJECTIVE

This guideline provides information and advice about the safe use of fume cupboards (ducted and recirculating) at RMIT.

SCOPE

This guideline applies to all RMIT colleges, portfolios and activities globally.

For information relevant to the use of Biosafety or Laminar Flow cabinets, specialist advice should be sought for their use.

Procedure

1. Introduction

Adequate ventilation is one of the most important engineering controls in the workplace to minimise exposure to hazardous substances. It is therefore vital that all fume cupboards are maintained to the highest possible standard. Staff must be trained in all aspects of fume cupboard operation and relevant maintenance procedures.

General Requirements

Fume cupboards are designed to protect the operator from exposure to chemical fumes and vapours. Fume cupboards must be tested to ensure air flow across that face of the cupboard (required ventilation) meets the requirements of the Australian Standards for Fume Cupboards (**AS/NZ 2243.8 and 2243.9**). Care needs to be taken when using fume cupboards so that operations within the cupboard do not adversely affect the fume cupboard efficiency:

- A fume cupboard shall not be used for the storage of chemicals. Refer to **HSW-PR32 Hazardous Chemicals** and the work instruction, **HSW-PR32-WI01 – Storage, Use and Disposal of Hazardous Chemicals**, for the requirements for storage of chemicals.
- The maximum allowable quantity of chemicals is to be determined by risk assessment. A label indicating this quantity must be displayed on the fume cupboard
- Ensure the fume cupboard is fit for the intended purpose and is clean and free from contaminants
- The fume cupboard sash should be positioned as low as possible to allow for maximum protection of the operator whilst maintaining optimal air flow
- Working at the very front face of the cupboard can cause air turbulence and therefore decrease protection for the operator. Avoid working within 10 cm of the front of the cupboard
- Keep the area clear directly behind the operator to minimise air turbulence within the fume cupboard
- Avoid having large equipment in the cupboard as this can affect air flow across the work area
- Make sure the make-up air is as per fume cupboard design and is not affected by air-conditioning, open windows or doors
- Avoid sitting at the fume cupboard whilst performing work

The Operational Leader responsible for the area where a fume cupboard is located is required to risk assess all intended work prior to operation and ensure that all staff and students receive training and information on the safe use of fume cupboards. Training records must be kept, and safe working procedures must be followed.

Fume cupboards with faults must be tagged out (**HR - HSW-PR52 – Lock-out/Tag out**) of operation and reported to Property Services for maintenance.

Prior to use, staff and students must complete a risk assessment for the proposed operations and check that the test certificate is in date and that the fume cupboard is fully operational.

Maintenance

AS/NZ 2243.8 Safety in Laboratories – Fume Cupboards and **AS/NZ 2243.9 Safety in Laboratories – Recirculating fume cabinets** state that fume cupboards should have a six-monthly and must have a twelve-monthly maintenance and testing schedule. At RMIT, maintenance is undertaken by a combination of third-party inspections and routine maintenance via PSG (Property Services Group). Areas must ensure all fume cupboards are tested as required.

Perchloric Acid Operations

Operations that involve heating perchloric acid such as acid digestions must only be done in a designated ducted fume cupboard. That is a fume cupboard fitted with a wash down facility and a scrubber unit. The construction of the fume cupboard must also conform to the requirements of **AS/NZ 2243.8 Safety in Laboratories – Fume Cupboards**.

Fume cupboards that are designated suitable for perchloric acid work are normally reserved for operations that are chemically compatible to minimise the risk of formation of metal perchlorates or organic perchlorates which in certain circumstances may explode.

Fume cupboards that are designated for perchloric acid use must be clearly labelled as such. Prior to the use of perchlorates or perchloric acid, a risk assessment must be performed, and checked by a technical officer.

Use of a designated perchloric acid fume cupboard for other incompatible chemistry should be avoided as it requires total decontamination of the fume cupboard system including the cupboard, ductwork, fan and housing. Risk assessment and clearance by a responsible officer is required.

Note - Scrubber units must run continuously during perchloric acid operations. On completion the wash-down facility must be run for at least 15 minutes and the work area gently flushed with water to ensure complete decontamination.

Maintenance of Scrubbers

It is the responsibility of the technical officer for the area to ensure that these units are working efficiently, and that any required routine maintenance is clearly outlined in safe working procedures and associated risk assessments:

- For perchloric acid and hydrofluoric acid operations, ensure that the fume cupboard controller is set so that the scrubber runs continuously during fume cupboard operation including the post purge period
- Ensure that the wash down facility runs for a minimum of 15 minutes on completion of operations and that the work area is completely washed down
- Ensure that the scrubber unit is checked prior to operation:
 - a) Check the water level in the sump (via the sight glass if fitted).
 - b) Depending on the frequency of operations dump the content and flush the sump prior to use or at regular intervals. In heavy use areas it may be necessary to regularly monitor the pH in the sump.
 - c) Check the operation of the scrubber (observe via the sight glass if fitted) to ensure that spray nozzles are operating correctly.
 - d) A log of routine checks should be kept.

2. Responsibilities

Senior Leaders

- Ensure there are resources available to implement this process and associated local area procedures in their area of control

Operational Leaders

- Implement the requirements of this process
- Ensure fume cupboards are tested and maintained as required
- Ensure risk assessments for tasks involving the use of fume cupboards have been completed
- Develop and implement control measures based on risk assessments

Staff, researchers, students and third parties

- Participate in completing risk assessments as required
- Complete training as required
- Follow this process and all reasonable instructions relating to laboratory and use of fume cupboards
- Follow the direction of RMIT in relation to laboratory and use of fume cupboards
- Report any problems encountered with the fume cupboard including, but not limited to, inadequate air flows or service certificates that are out of date.

HSW Team

- Provide advice, training and instruction in laboratory and use of fume cupboards where required
- Regularly review this process in consultation with relevant stakeholders
- Develop and report on KPIs relevant to this process
- Monitor compliance with this process and report on outcomes

3. Definitions

Defines any key terms and acronyms relating to the process where they apply

Term / acronym	Definition
Scrubber	A scrubber (fume scrubber) is a device fitted to the fume cupboard exhaust duct designed to wash contaminants from the effluent fume, usually with water or aqueous solution.
Wash-down	The wash-down irrigates all concealed surfaces below the fume scrubber, such as the rear baffles and ducting above the work area.

4. Supporting Documents

- HR - HSW-PR33 – Lab, Workshop and Studio Safety
- HR-HSW-PR12 Workplace Inspections
- HR-HSW-PR12-CL04 – Workplace Inspections – Laboratory Areas Checklist Form
- HR - HSW-PR04 - HSW Records Management
- HR - HSW-PR32 - Hazardous Chemicals
- HSW-PR32-WI01 – Storage, Use and Disposal of Hazardous Chemicals
- HR - HSW-PR52 – Lock-out / Tag out
- AS/NZ 2243.8 - Safety in Laboratories – Fume Cupboards

- AS/NZ 2243.9 Safety in Laboratories – Recirculating fume cabinets
- AS/NZS 2982 - Laboratory design and construction
- Occupational Health and Safety Act 2004 (VIC)
- Occupational Health and Safety Regulations 2017 (VIC)