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| Version | Description of Change | Date Issued | Approved by | Date |
| 1 | SOP Created | 30-03-23 | Nicola Hutchings | 30-03-23 |
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**This Procedure outlines procedures for correct use and maintenance of fume cupboard/ fume hood.**

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| Task Summary |
| A fume cupboard is designed to remove air-borne hazardous substances generated during laboratory experiments such as gases, vapours, aerosols, and particulates/dust. Work substances that produce/generate toxic or harmful airborne substances should be handled in a fume cupboard to eliminate/reduce the risk of exposure to an acceptable level. A fume cupboard also serves as a physical barrier between the experiment and user including those in close proximity offering a measure of protection against inhalation exposure, chemical spills run-away reactions and fire. |

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| Related Risk Assessments |
| See the general example risk assessment for use of [fume hoods](https://www.staffnet.manchester.ac.uk/physics-and-astronomy/health-and-safety/risk-assessment-library/) on the Physics Intranet |

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| Preconditions |
| P&A H&S Induction. |
| Appropriate training – as per laboratory/cleanroom/workshop local rules. |

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| SOP Overview |
| 1. Performance criteria 2. Pre-use checks 3. During use 4. Post-use checks 5. Routine Maintenance |

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| Step | Description |
| **1 Performance Criteria** | |
| 1.1 | The following standards of performance in terms of face velocity are considered to  represent good practice and are supported by research literature:   |  |  | | --- | --- | | **Face Velocity (average)** | **Use of fume cupboard** | | Minimum 0.7 m/s | Radioactive work | | Minimum 0.4 m/s \* | Standard work with hazardous | | Minimum 0.2 m/s | Storage only |   \*Fume cupboards that are used for higher risk processes involving use of volatile highly toxic or special risk substances e.g., cyanide or hydrofluoric acid operations may have higher face velocities. |
| **2 Pre-use checks** | |
| 2.1 | Fume cupboards should be tested and maintained monthly. Monthly checks are carried out by the I&F technical team. The Technical Operations Manager has a calibrated air vane anemometer (fume hoods) which are capable of measuring the air velocities.  Users should perform [pre-use fume hood checks](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.staffnet.manchester.ac.uk%2Fmedia%2Feps%2Fchemistry-intranet%2Fphysics%2FFUME-CUPBOARD-PRE-USE-CHECKS.docx&wdOrigin=BROWSELINK) before use, these should be displayed on or near the fume hood. |
| 2.2 | Confirm that the fume cupboard is working satisfactorily by a visual check of  function lights, air flow digital display is in safe zone (meets minimum requirements in 1.1) and by means of a tissue paper strip in the opening. For high-risk operations the air velocity must be measured using a vane anemometer, you can request this from the I&F Technical team. |
| 2.3 | Ensure that the correct PPE is worn as detailed in individual, general lab and chemical risk assessments. Ensure that the correct gloves are worn for the experimental work being carried out. |
| 2.4 | Check for obvious surface contamination. Clean if necessary, to avoid adverse  reactions with the chemicals you intend to use. |
| 2.5 | Ensure that you have enough space to conduct your work safely and that all  unnecessary items of equipment and chemicals not required in the process are  removed. |
| 2.6 | Ensure that all items for the experiment are available in the fume cupboard prior to commencing work. |
| 2.7 | Position equipment, apparatus, and materials in the centre and back of the  cupboard to minimise disturbance to airflow. Where practical, place everything  within the cupboard before starting operations. |
| 2.8 | Equipment in the fume cupboard should be kept to a minimum and sited at least  15 cm/ 7 inches from the plane of the sash to ensure efficient containment. Also ensure  that items are kept away from the sash opening to allow instant closure in an  emergency. |
| 2.9 | Avoid placing large pieces of equipment in a fume cupboard, they spoil the  aerodynamic flow and may reduce the containment of fumes. If their use cannot  be avoided they should be raised up about 10 cm using lab jacks, to allow  air to pass unimpeded across the work surface and exhaust from rear of fume  cupboard. |
| **3 During use** | |
| 3.1 | Fume cupboards should be used with the sash as low as reasonably practicable as this gives the best containment of fume/vapour and helps contain any fire or explosion that may occur. Use the sash position to your advantage   * Fully open, to provide access for setting up equipment * Partially open to a comfortable work height when handling the material inside the cupboard, * Lower as far as is practicable, when the process is in operation and your intervention is no longer required. |
| 3.2 | Try to avoid sudden rapid movements in front of the cupboard. These can cause turbulence that may draw the airborne hazardous material out of the cupboard. |
| 3.3 | Do not use naked flames as they will have a serious adverse effect on the air flow |
| 3.4 | Perchloric acid must not be used in fume cupboard, unless fitted with wash down facility, as this presents a risk of fire, consult your Safety Advisor for advice. |
| 3.5 | Chemicals must not be stored in a fume cupboard used for experimental work,  they could escalate an accident. |
| 3.6 | Hotplates must be kept to a minimum and be aware that they might adversely  affect the airflow. |
| 3.7 | Any accidental spill of chemicals should be cleaned up immediately (i.e., as soon  as it is safe to do so). In the event of a spillage of a hazardous substance inform your line manager/ supervisor and Safety Advisor. Use the chemical spill kit provided. Used spill mats and any waste from cleaning must be disposed of as “hazardous waste”. Contact your Safety Advisor to replenish stock. |
| 3.8 | If an experiment is left running out of hours, a contact name and telephone  number must be prominently displayed. Do not leave potentially hazardous work  unattended. |
| 3.9 | All ducted local exhaust ventilation associated with roof fans in the Schuster building switches off in the event of a fire and during the weekly fire alarm tests. Therefore, there is no extraction during a fire alarm. Users of ducted fume hoods should lower the sash and leave the area immediately. All ducted LEV users should plan their work to ensure they are not working with hazardous materials during the weekly fire alarm test on Wednesdays at 9:15 am. |
| 3.10 | If the fume hood alarms before or during use, this is informing the user that there is an issue, shut the sash and do not use, report faults immediately to I&F Technical team and also via the [Estates helpdesk](https://www.estates.manchester.ac.uk/services/msu/helpdesk/). Ensure signage is placed on the fume hood to warn others users not to use. Signage can be provided by the I&F Technical team. |
| **4 Post-use checks** | |
| 4.1 | At the end of your experiment remove equipment and clean the surfaces. Leave the fume cupboard in a clean, tidy, and safe state. |
| 4.2 | Dispose of waste in a safe appropriate manner as identified by your individual risk or chemical assessment. “Hazardous waste” must be disposed of appropriately. If unsure contact ypour Safety Advisor for advice. |
| **5 Routine Maintenance** | |
| 5.1 | Fume cupboard is checked for correct operation as per Department procedure and recorded via the I&F Technical Team. Fume cupboards should be tested and maintained monthly.  Users are required to preform pre-use checks on fume hoods before use. |

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| Referenced Documents |
| Fume-hood-digital-display-SOP |

End of Procedure