

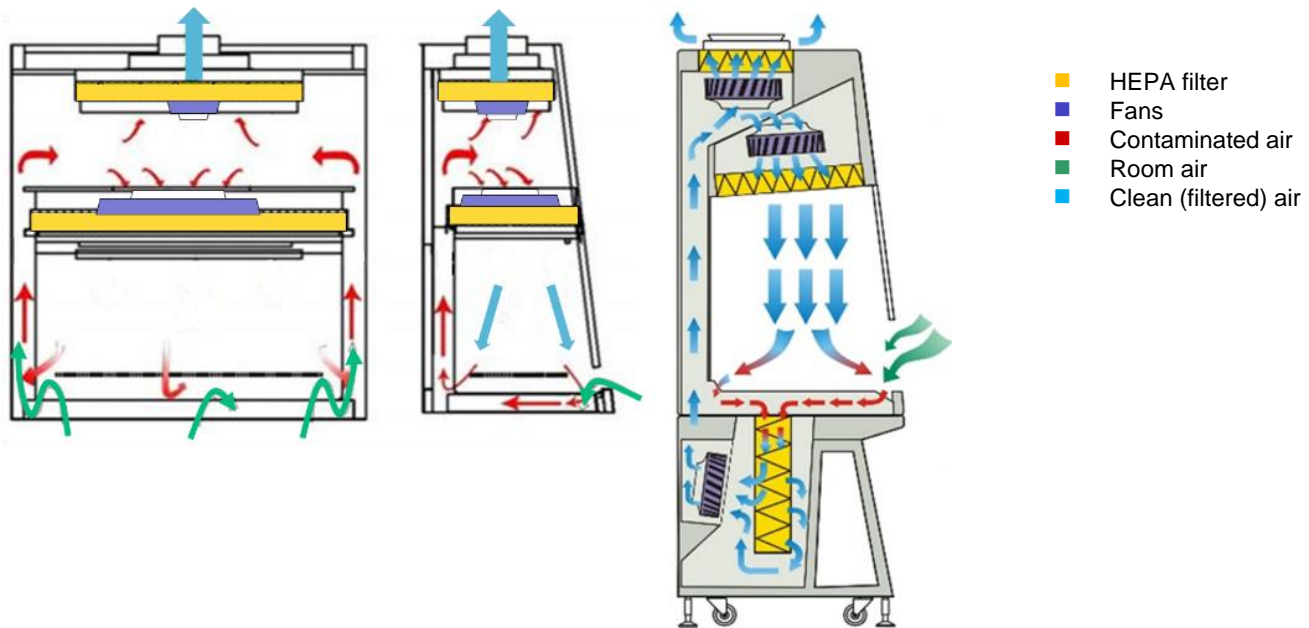
## Standard Operating Procedure

### Use of Class II Microbiological Safety Cabinets

#### 1.0 Introduction

The term microbiological safety cabinets (MSC) and biological safety cabinets (BSC) can be used interchangeably, and both refer to the same piece of equipment. For this SOP, the term MSC will be used. Class II MSCs are designed to protect users from biological hazards. Air is drawn in through the front of the cabinet and is directed below the main working platform of the cabinet via special baffles and perforations in the front lip of the cabinet. This inflow of air through the front prevents the escape (contains) the agents in use. The air is passed through a HEPA filter and forms a sterile curtain (down flow) of air from the ceiling of the cabinet, protecting the samples from airborne contamination.

In most European designs about 70-80% of the air is recirculated within the cabinet (as the down flow of "sterile" air). 20-30% of the air is discharged, either directly outside (ducted) or back into the laboratory. Some cabinets are fitted with multiple in-line HEPA filters as an additional precaution against filter penetration.



These cabinets are suitable for work with hazard group 2 biological agents, human or animal samples and cell cultures. Harmful chemicals which are volatile (give off vapour) should not be used in these cabinets as they will not be captured in the High Efficiency Particulate Air Filter (HEPA) and will recirculate in the cabinet. For recirculating cabinets, these chemicals will be exhausted into the laboratory. For more information see Laboratory Equipment – Containment and Extraction.

## 2.0 Pre-Use Check

Before using the MSC you should carry out a number of checks, these include:

- Ensuring the cabinet is the correct type for the activity.
- Checking the cabinet has a test sticker confirming that it has been thoroughly examined and tested within the last 14 months (and has passed the test). Do not use the cabinet if it is outside the 14-month test period. Contact the lab technician / Faculty Technical and Operation Team.
- Before using a cabinet, the night door should be opened, fans switched on and allowed to stabilize for 5 minutes.
- Checking the cabinet airflow is within the safe-range, the average face velocity should read above 0.4 m/s - do not use the cabinet if it is not working properly.
- Ensuring there is sufficient space to conduct the work safely. Equipment in the cabinet should be kept to a minimum and sited at least 15 cm inside the plane of the sash to ensure efficient containment.
- Items should not obstruct the opening of the cabinet as this may disrupt the protective inward airflow. The rear baffle should also not be obstructed.
- Avoid placing large pieces of equipment in the cabinet where possible, as they may reduce the effectiveness of the containment. If their use cannot be avoided, they should be raised up about 10cm using lab jacks, in order to allow air to pass unimpeded across the work surface.
- Clean down surfaces and equipment being brought in with an appropriate disinfectant. See Disinfectant and sterilisation sheet for more information.

## 3.0 During Use

- Keep the work area clean and tidy.
- Perform operations as close to the middle of the cabinet as possible.
- Avoid swift arm and body movements in front of the cabinet, they can cause turbulence that may draw the airborne hazardous material out of the front of the cabinet.
- Cabinets are designed for single users only – multiple bodies in front of the cabinet can affect containment. If another person is observing work, ensure they stand a little away (e.g. >30 cm) from the cabinet opening.
- Hotplates and Bunsen burners must be kept to a minimum and be aware that they might adversely affect the airflow. If used, these should be placed at least 10 cm from the side and back of the MSC to avoid damage to the MSC structure.

If you need to work at the MSC for a prolonged period, follow the guidance below to reduce your chance of developing a musculoskeletal disease:

- Use a well-supported chair so your back is supported in a natural position.
- Work at elbow height and avoid reaching above head height where possible, the use of tools to reach hard to reach higher sides is advised. Maintain upright posture.

- Use a pad to rest arms on if long term working is required. Otherwise, float your elbows and forearms above the baffles to reduce contact stress.
- Take regular breaks to avoid overuse injuries.
- Place all work material and disposal bins within easy reach.
- Make sure the viewing window is clean and without glare to reduce eye strain.
- Support for feet on a ring or a foot stand.

#### 4.0 After Use

- Remove all waste and materials from the cabinet, disinfect equipment with a suitable disinfectant. For more information see Disinfectant and Sterilisation document.
- All parts of the working area of the cabinet should then be swabbed with a suitable disinfectant (as recommended by the cabinet manufacturer).
- **Note** that although swabbing with 70% Ethanol is often used for this it may presents a serious risk of fire if there are any naked flames or sources of ignition in or near the cabinet.
- The cabinet should be run for at least 5 minutes after use to assist the removal of residual contaminated aerosols.
- Switch off the cabinet and shut the night door.
- The UV lamp, if fitted, should never be on while the cabinet is in use.

#### 5.0 Emergencies

- If the airflow alarm sounds when in use, make the work secure e.g. seal tubes.
- If the cabinet air flow fails during use, if safe to do so seal the front with the night door, switch off and clearly label and contact the lab supervisor/ technician.
- Deal with spillages immediately, using the appropriate disinfectant and/ or correct absorption materials.

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## 6.0 Amendment Record

Revision	Date	Amendment(s)
0		Draft
1	July 18	New SOP
2	May 21	Minor review
3	Aug 24	Review on ergonomics