

Standard Operating Procedure

SOP105

Title: USE AND MAINTENANCE OF THE FASTER BSC-G 2000 BIOLOGICAL SAFETY CABINET (DUCTED)

Location: CBE Tissue Engineering Laboratory (T208B)

1. PURPOSE

To describe the use and maintenance of the Faster BSC-G 2000 Class II ducted Biological Safety Cabinet (BSC).

2. SCOPE

This SOP applies to procedures for the operation and maintenance of the Faster BSC-G 2000 ducted BSC sited in the CBE Tissue Engineering Laboratory (T208B), located in the Wolfson School. The SOP describes controls, operating rules and limitations, the principles for testing and maintenance and procedures for record keeping, reporting and emergency shutdown of the equipment.

3. SPECIAL NOTES: HEALTH & SAFETY

- (i) Always wear appropriate PPE for working inside the cabinet.
- (ii) DO NOT use radioactive, toxic or corrosive substances (e.g. chlorine based substances such as sodium hypochlorite) inside the Class II cabinet. Aerosol contaminants from these substances will not be removed by the HEPA filters.
- (iii) DO NOT use substances releasing explosive vapours, except 70% IMS, which is used for surface disinfection.
- (iv) DO NOT handle any powder form materials inside the cabinet which can block the HEPA filter, thereby reducing the airflow velocity and protection.
- (v) DO NOT put any paperwork in the cabinet, as it can obstruct the BSC air intake grill.
- (vi) DO NOT use heat sources, e.g. Bunsen burners, or centrifuges in Class II cabinets.
- (vii) As a protection from harmful UV radiation, the UV lamps can only be activated if the front window is completely closed. Direct exposure to UV radiation can cause skin burn and conjunctivitis. Guidance on the use of UV-lamps is given in the University "Radiation and protection – Policy and Guidelines" document which is available on the Environmental, Health and Safety Services website.
- (viii) DO NOT place anything over the front grille of a cabinet. Disrupting the airflow in this manner allows contaminated air from inside the cabinet to blow out of the cabinet into the lab or directly at the person sitting at the cabinet. It also allows non-sterile air from the room to blow into the cabinet over your experiments.
- (ix) DO NOT place centrifuges or microfuges inside the cabinet unless an operator protection factor

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test (KI test) has been carried out with it running in situ and it has been shown not to compromise operator protection.

- (x) DO NOT place large bulky equipment in the cabinet or place equipment on air grilles (both disturb air flows) unless appropriate controls have been implemented or operator protection factor test (KI test) has been carried out with it running in situ and it has been shown not to compromise operator protection.
- (xi) Avoid sudden and sweeping movement of your arms to minimise disturbance of air flow patterns.
- (xii) Work should be performed as deeply into the hood as possible, avoid working on the part of the work surface near the front opening of the cabinet. Avoid upstream contamination of the material; avoid putting hands or any object between the absolute filter and the sterile material. Infectious agents should not be placed directly adjacent to, or directly on the intake grilles.
- (xiii) Waste generated in the BSC MUST be decontaminated or autoclaved for disposal according to SOP003.
- (xiv) To work in the BSC the airflow MUST be fully activated and steady, and the internal working surface disinfected using chemgene wipes, 1:50 Chemgene spray (1:20 for deep clean) and 70% IMS.
- (xv) The BSC warning system constantly monitors the safety-relevant device functions including the inflow air velocity, the down flow air velocity, and the working position of the front window. If the warning system detects changes to one of these device functions outside specified safety values, it issues an audible and a visual alarm signal.

4. RESPONSIBILITIES

CBE Laboratory Users

- (i) Shall complete proper training before work can commence using the BSC. An approved training certificate must be provided and this should be retained in the individual's training record before using the BSC.
- (ii) Shall ensure that they are familiar with the BSC, its controls, requirements and emergency procedures by reference to this SOP, and the Manufacturer's Operating Instructions.
- (iii) Shall ensure that the BSC is suitable for the work they intend to carry out by completing a risk assessment prior to the beginning of experiment.

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- (iv) Shall check that there are no scheduled electrical shutdowns before commencing work; according to SOP004.
- (v) Shall complete the Daily Usage Record each time they use the BSC, and ensure that equipment is removed from the cabinet and working surfaces are disinfected after use.
- (vi) Shall carry out the weekly maintenance of the BSC and record in weekly housekeeping sheet .
- (vii) Shall complete the equipment maintenance record for any maintenance performed.
- (viii) Shall record alarm sounding events that indicate non-conformance or malfunction on the BSC Monitoring Form and notify the Laboratory Manager/Responsible Person.
- (ix) Shall report any changes to the room e.g. placement of new equipment, relocation of large equipment, overcrowding etc, that may compromise the BSC operator protection, to the Laboratory Manager/Quality Manager.

Responsible Person (RP)/Laboratory Manager (LM)

- (i) Shall ensure laboratory personnel are given suitable information, instruction, training and supervision in the correct use and maintenance of biological safety cabinets. The requirements for competence to use a BSC should include full instruction in the classification of cabinets, appropriate and inappropriate use, performance limitations, safe working procedures, decontamination procedures and the principles of airflow and operator protection tests, as stated in Part 4 of the relevant British Standard (BS5726:1992). Upon completion of training laboratory personnel will be issued a training agreement by the Laboratory Manager to show that they are a designated authorised user
- (ii) Shall coordinate weekly maintenance duties to be performed by laboratory personnel (according to SOP004).
- (iii) Shall Investigate reported problems or alarms associated with BSC usage.
- (iv) Shall organise the maintenance, repairs and annual certification of the BSC by trained and authorised contract / service personnel .
- (v) Shall ensure that prior to authorising the commencement of maintenance, repairs or annual certification testing that the BSC is suitably disinfected in accordance with SOP003 and that a "Decontamination Certificate" is issued.
- (vi) Shall ensure that any changes to room design i.e. in terms of relocation of large equipment, placement of new equipment, room air handling or personnel traffic routes etc are assessed for

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their affect on BSC performance (operator protection) and if required, that appropriate control measures or test measures (operator protection factor test) are implemented.

5. EQUIPMENT AND MATERIALS

- (i) BSC –G2000 Vertical Laminar Airflow Cabinet, Model No. BSC –G-2-6, Serial No. 103 located in room T208B
- (ii) 20W UV Lamp
- (iii) Disinfection Solutions: 1% Virkon Solution, 70% IMS, Chemgene wipes, 1:50 Chemgene Spray and 1:20 Chemgene Spray.

6. PROCEDURE

6.1. Before commencing work in the Class II BSC

- (i) Check for correct operation of alarms and indicators (Refer to operation and Maintenance Manual for description of alarms and error messages). Alarms sounding indicate non-conformance or malfunction
- (ii) Check and record air velocity inflow readings are within safe limits as set by the manufacturer. For Class II cabinets with digital readout this is greater than 0.4m/s
- (iii) Check and record residual HEPA time readings are more than 100 hours. Notify the Laboratory Manager if less than 100 hours who will arrange for the HEPA filters to be replaced by service engineers
- (iv) Switch on the UV light by pressing the “UV” key (180 minutes UV exposure) or “UVTimer” (pre-set at 30 minutes) and press the “arrow” keys to adjust the time or “SET” to confirm - - The BSC should be sterilised by **UV light exposure** for 30 minutes once a day in the morning before use, or between handling of different biological materials or reagents.

NOTE: UV is generally ineffective for sterilising the interior of cabinets as radiation is directional and therefore for it to be effective the cabinet must be totally empty

CAUTION: Ensure that the UV light is off before starting work - Do not work with the UV light on; exposure of skin and eyes to direct radiation can cause skin burn and conjunctivitis.

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6.2 Setting up the Aspiration Bottle

Every day the first user of each BSC will exchange the used aspiration bottle for a clean bottle (whether they are using the aspiration trap or not) following the below procedure:

- i. Dispose of the 24 hr virkon treated waste contained within the spare aspiration bottle (the one not attached to the pump) down the drain followed by copious amounts of running water.
- ii. Rinse this bottle.
- iii. Add 1 x 5g virkon tablet with 50ml of water for every 250ml expected waste – if in doubt start with 1 tablet as users throughout the day can add more if required.
- iv. Record on the BSC log sheet that the aspirator bottle has been replenished.
- v. Remove the current aspiration bottle attached to the pump, making sure to fit a lid and write the disposal date on this bottle (the following days date) and leave to treat for 24hrs (this will be disposed of by the first user the following morning when the procedure starts again).
- vi. Attach the clean/refreshed aspiration bottle to the pump.
- vii. Throughout the day each new user is responsible for making sure that there are enough virkon tablets in the aspiration bottle for the amount of waste contained within it – if more tablets are required the user will add the desired number of tablets and record this on the log sheet.

6.3. Working procedures within the Class II cabinet

6.3.1. Start up procedure

- (i) Ensure that any air conditioning units are switched off – DO NOT work with the laboratory air conditioning on.
- (ii) Remove the front closure panel and turn on the main switch. The “lighting” shaped button should light blue
- (iii) Ensure that the viewing window is in the work standard position (200mm). If not, press the arrow button to adjust the height of the sash window. **CAUTION:** DO NOT press the red button and the arrow button together since this will fully close or fully open the sash window
- (iv) Press the main key 1/0 and enter the password to switch on the cabinet. At first the display shows “CHECK PANEL” and the corresponding control LEDs of the keyboard light up. Then the message “STAND-BY” is displayed for about 40 seconds and the hour-counter starts operating
- (v) Ensure that the airflow and balance indicators are within the operating range indicated, and that the blowback valve on the exhaust pipe is operating. Check the velocity of airflow. LAF (Laminar airflow) velocity must be within the range of 0.25 to 0.5m/sec and BARR (air barrier) velocity must be ≥ 0.4 m/sec. The green LED should light up when the ventilation works correctly. Do not use if

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in any doubt about cabinet performance

- (vi) The BSC grilles should be cleaned using chemgene wipes, 1:50 chemgene spray (1:20 for deep clean) followed by 70% IMS spray on tissue paper. Put **UV light on** for 30 minutes.
- (vii) Check whether the waste disposal containers require changing (sharps container, autoclave bags) and refer to SOP003 for disposal of waste. Ensure all required equipment is ready to hand (place it on the trolley).
- (viii) Introduce only those items necessary for the intended work inside the cabinet. Keep the inside of the cabinet free of clutter. Items cluttering on the work surface would increase the likelihood of things getting knocked over and also to minimise the problems of cleaning up in the event of a spill
- (ix) Ensure that all the equipment you need is ready to hand (place it on the trolley) to avoid disruption of airflow
- (x) Ensure that all components of the system (the inside of the vessel, the medium and any objects used in the manipulative processes) are sterile; any autoclaved or sterilised vessels with lid opened outside of the class II cabinet should not be treated as sterilised

6.3.2. General Working Procedure

The inward airflow that is drawn through the working aperture of open-front cabinets (Class I and II) can be disturbed by, for example, sudden movements of the arms of the operator, turbulence around the equipment placed inside the cabinet or air movements outside the cabinet. To minimize these observe the following:

- (i) Keep doors to the room closed
- (ii) Keep the amount of equipment in the cabinet to a minimum:
 - Large equipment (e.g. centrifuges, especially air-cooled models) should not be used within an open fronted cabinet unless appropriate testing has been done to establish that containment performance is maintained
 - Bunsen burners (BB) – Do not use BB inside the BSC – they disturb airflow and reduce both operator and product protection; they are a fire risk; they can damage HEPA filters
- (iii) Avoid sudden movement of arms and moving hands in and out of the cabinet
- (iv) Sit in a comfortable position where you can see clearly through the viewing window and you can

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reach anything you need without leaving your seat

- (v) Do not obstruct any of the air- intake grills at the front or rear of the cabinet, as this will affect the air inflow
- (vi) Work as near to the centre of the work area as possible – at least 15cm from front opening
- (vii) Avoid unnecessary traffic in the vicinity of the cabinet. Do not let others in the lab intrude in your space – keep a 1 metre work area along the length of front panel clear. Use aseptic techniques for working in the Biological Safety Cabinet as follows:

6.3.3. Aseptic techniques

- (i) Always wear protective disposable gloves before putting hands or placing items in the BSC. Use appropriate PPE according to the containment level and risk assessment for the work.
- (ii) Ensure all items entering the BSC are clean / disinfected by spraying or wiping with chemgene wipes or 1:50 chemgene. (including gloved hands).
- (iii) Keep vessels containing cultures, media etc closed when not in use.
- (iv) Use aseptic manipulation techniques that minimise the possibility of contamination: single hand / little finger opening technique; avoid culture manipulation over opened vessels; use sterile contact materials (e.g. pipettes); ensure sterility is maintained during handling (prevent contamination by casual contact with un-sterile items).
- (v) Use manipulation techniques that minimise aerosol production: avoid frothing of capped cultures when mixing by gently rolling / swirling rather than vigorous shaking; eject pipette contents by putting the tip into a liquid or onto a surface to avoid bubbling and splashing.
- (vi) Avoid spills by ensuring close proximity between vessels when transferring liquids.
- (vii) Disinfect spillages immediately and follow the appropriate spill procedure (Refer to SOP038). Upon contamination or changing between different organisms/cell lines, disinfect the cabinet with UV radiation or chemical disinfectants (Refer to SOP003)
- (viii) Do not mix sterile with infected materials and avoid passing potentially infected material over clean material. Mix by gentle rolling and swirling rather than vigorous shaking (to avoid frothing)

6.3.4 Shut down procedure

- (i) Remove all items that have been brought into the cabinet and dispose of according to SOP003 or store according to SOP005. Avoid contamination of sterile items or aseptically produced cultures by ensuring they are sealed / closed before removal from the BSC, after removal ensure items

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are properly labelled (user name, culture type).

- (ii) When work is finished clean the interior working surface of the cabinet with chemgene wipes and 1:50 chemgene followed by 70% IMS on tissue paper.
- (iii) Leave the fans running for 15-20 minutes before switching to OFF mode to allow removal of remaining aerosols. If UV disinfection is planned, check and set the UV disinfection time.
- (iv) Turn off the light by pushing the blue key. Press 1/0 key switch and enter the password for switching off the cabinet
- (v) Activate the UV disinfection routine if required. . If UV disinfection is planned, ensure the removal of the stainless steel covers from the lamp mountings in the side walls during cleaning.
- (vi) **NOTE:** DO NOT empty the aspiration bottles immediately after use as virkon will require overnight contact time to ensure contents are rendered safe before disposal down the drain.
- (vii) **Ensure safety precautions are maintained during cleaning of the BSC when used for dangerous pathogens:** Refer to SOP003, SOP006 for appropriate disinfectant or fumigation procedures. Avoid removal of the working surface grilles, however if absolutely necessary the following precautions should be taken:
 - Wear heavy duty PVC or rubber gloves (that can be disinfected after use), over normal surgical gloves to provide adequate protection for hands and wrists.
 - **CAUTION:** use an implement to hook or lever the grilles up from their housing so that the sharp edges may be grasped safely without damaging hands or fingers.
 - Spray the appropriate disinfectant at the prescribed dilution for the pathogens in use onto all exposed surfaces and allow sufficient disinfection time before proceeding.
 - Disinfect the outer gloves before removal.
- (viii) Secure the viewing window. If necessary adjust it and ensure that it is in the correct position before putting on the closure panel
- (ix) Replace the closure panels when the cabinet is not in use. They must be used in accordance with the manufacturers instructions and should be treated with care as seals can be damaged
- (x) Ensure that all containers for autoclaving and incineration are marked correctly and secured. Only remove contaminated materials from the cabinet as directed by local protocols. Normally this will mean only when the material can be taken directly to the autoclave, although exceptionally it may be permitted to place containers in a holding area within the containment area

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6.4 Emergency Procedures

6.4.1. Fire

- (i) Leave the BSC switched on.
- (ii) Close the laboratory door and leave the building, according to University Health and Safety procedures.
- (iii) Do not re-enter the building until told to do so by authorised personnel.

6.4.2. Electrical shutdown

- (i) In the event of a power failure, the BLUE mains light on the front of the BSC display will switch off. And the BSC is no longer operative.
- (ii) Immediately cap all culture vessels and media bottles that have been handled in the BSC. Leave all vessels in the BSC and discontinue the experiment. Place a "Do Not Use" label on the BSC.
- (iii) When power supply returns, the BLUE mains light will switch on. Leave the BSC switched on for 30 minutes before commencing any work within the cabinet

6.4.3 Spillages within the BSC

Refer to SOP038 for procedures for dealing with spills within the BSC

6.4.4 Equipment Malfunction

- (i) If any part of the equipment fails or malfunctions, the user should contact the Laboratory Manager. With permission of the Lab Manager the user should consult the Operator Instruction Manuals to access fault finding, error displays and troubleshooting procedures.
- (ii) All problems and corrective actions should be recorded in the Equipment Maintenance Log
- (iii) If the equipment fails to work or malfunctions and cannot be rectified according to troubleshooting procedures detailed in the Operator and Users Manuals the Laboratory Manager must be informed and a "Do Not Use" notice should be posted on the equipment. Contact the manufacturer for advice and coordinate with the Lab Manager for external maintenance and servicing.
- (iv) External maintenance and servicing of the equipment can only be performed after it has been suitably disinfected (refer to SOP003 for further details) and a 'Decontamination Certificate' has been issued (a proforma is available on the CBE website).

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6.5. Preventative Maintenance

6.5.1 Annual Maintenance (see Annex 2)

Biological Safety Cabinets must be regularly serviced and tested (at least annually but also subject to regular risk assessment review) by authorised contract / service personnel in accordance with the requirements of BS EN 12469 2000 and under the COSHH Regulations, to demonstrate performance under conditions of use and protection to the user from airborne hazards. Under COSHH regulations, records of examinations, tests and repairs must be held for 5 years .

- The BSC must be decontaminated/fumigated prior to service by contractors, or when decontamination/fumigation becomes necessary due to gross contamination, and a “Decontamination Certificate” must be issued prior to maintenance. Warning notices must be posted prior to commencing decontamination/fumigation procedures to prevent entry to the laboratory (see Annex 1).
- Operator protection (KI Discus) test must be included as part of the commissioning process for new or relocated cabinets and annual maintenance certification. The tests are to be carried out under normal working conditions (e.g. air conditioning on) and the operator protection factor must be $> 1.0 \times 10^5$ (in accordance with British Standards).
- All cabinets must have volumetric airflow measurements and airflow patterns. For Class II cabinets the inflow should be no lower than 0.4 m/s, and the down flow should be between 0.25 m/s and 0.5 m/s.
- All cabinets must have an exhaust HEPA filter test by introducing an aerosol challenge to the airstream upstream of the filter and testing to see if there is any penetration downstream. Filters should have an efficiency of at least 99.995% (or penetration of $<0.005\%$).
- A label must be attached to the BSC to indicate when it was last serviced and when next service is due.

6.5.2. Daily Maintenance

- BSC user log must be filled in every time the user uses the BCS.
- The cabinet should be disinfected with Chemgene wipes and 1:50 Chemgene spray (spray onto wipe to top up) before and after work commences to ensure sterility
- Daily checks of the grills, aspiration bottle and pump should be conducted to ensure a safe working environment.
- Activate the UV disinfection routine for 30 minutes after use

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6.5.3 Weekly Maintenance

- i. Weekly maintenance should be recorded on weekly housekeeping checklist
- ii. Turn the BSC off by pressing and holding the Set button, open the front of the BSC, by pulling up the whole of the front.
- iii. Remove the BSC grills and place on trolley.
- iv. Inspect the tray beneath the grills checking for any stains or spills
- v. Spray 1:20 Chemgene and wipe with paper towels (do not release paper towels as it blocks HEPA filters)
- vi. Wait to dry
- vii. Spray 70% IMS and wipe with paper towels

NOTE: Bests practice for wiping is as follows:

- • Wipe the ceiling of the BSC
- • Wipe the side walls (avoiding going over the UV light) with a wiping motion towards the front of the BSC.
- • Wipe the tray with a wiping motion towards the front of the BSC.
- • Wipe the inside of the front window.

viii) Replace the grills inside one at a time by wiping the grills all while they are outside the BSC with 1 in 20 chemgene, allow to dry and then with 70 % IMS. Ensure that the grill being replaced is still wet when going into the BSC.

ix) Once all BSC grills are replaced, lower the BSC front.

x) Turn on the BSC, and turn on the UV light and leave for one hour. Complete the log sheet.

xi) If BSC is not in use, turn off fully.

6.5.4 Deep Clean and Inspection of the BSC's

This is performed by RP/LM and team of volunteers. The cleaning is performed after the BSC has had a safety inspection by the external contractor (arranged by the LM/RP), and/or when the labs are under going a deep clean. This should be recorded in the equipment maintenance log.

When this clean is performed after the safety inspection, complete and attach the Decontamination Form to the External contractor inspection and safety report, if this is done for a deep clean, complete the BSC daily usage record sheet and equipment maintenance record.

i) Ensure that the BSC is turned off and the front sash is shut. To turn off the BSC press and hold the SET button on the BSC remote control till all lights in the display panel are off.

ii) Pull open the front window to the BSC all the way till it will come to a stop.

iii) Remove the BSC grills and place on trolley.

iv) inspect the tray beneath the grills checking for any stains or spills

v) Clean inside of BSC with 1% virkon on paper towels.

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- • Wipe the ceiling of the BSC
- • Wipe the back wall
- • Wipe the side walls (leaving out the UV light) with a wiping motion towards the front of the BSC.
- • Wipe the tray with a wiping motion towards the front of the BSC.
- • Wipe the inside of the front window.

vi) Start the stop watch for 10minutes and at the end of the 10 minutes repeat (v) with 1:20 ChemGene solution followed by 70% IMS impregnated paper towels.

vii) Close the front window (the grills are sitting outside).

viii) Wipe each grill with Virkon wipes and replace on trolley.

ix) Start the stop watch for 10minutes.

x) At the end of the 10 minutes, replace the grills inside one at a time by wiping the grills all over outside the BSC with 1:20 Chemgene solution followed by 70% IMS . Ensure that the grill being replaced is still wet when going into the BSC.

xi) Once all BSC grills are replaced, lower the front.

xii) Turn on the BSC by pressing and holding the Set button, turn on UV light and leave for one hour.

xiii) If BSC is not in use, turn off fully.

CAUTION: Take care not to release the cleaning tissue, as it will block the HEPA filter.

CAUTION: Only use 1% Virkon externally to wipe down the front panel and front window, as well as the cabinet legs and the pump used for the aspirators.

7. DOCUMENTATION

The following records are outputs of this SOP:

- 7.1. BSC Daily Usage Record
- 7.2. Test & Examination Record
- 7.3. Biological Safety Cabinet Training Agreement
- 7.4 Weekly Housekeeping record
- 7.5 Equipment Maintenance Record

These records shall be filed in the Equipment File and stored in the CBE Office or otherwise archived for future review or retrieval

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SOP Version History

Version Reviewed	Date Revised/ Reviewed	Revision Summary	New Version Number
001	6 th July 2020 by C.Kavanagh	Annual review to update procedures	002

ANNEX 2: Routine Maintenance, Examination and Test

In order to meet the British Standard specification, cabinets undergo various testing when manufactured. Within the British Standard there are also requirements for tests on installation and regularly thereafter to demonstrate performance under conditions of use.

Most importantly, biological safety cabinets constitute local exhaust ventilation (LEV) systems in that they offer protection to the worker (user) from airborne hazards. As such there is a requirement for regular maintenance, examination and test under the COSHH Regulations. Therefore, all biological safety cabinets should be serviced on an annual basis and undergo examination and test at that time. It is a requirement of the COSHH Regulations that a record be kept for 5 years of the examinations and tests and of repairs. Health and Safety Executive Inspectors are likely to request sight of, or copies of, records during visits to the University.

The certificate should show tests results for:

- Volumetric airflow measurements and airflow patterns

These include various measurements of face velocity (inward airflow) at the front aperture and, in Class II cabinets, the velocity of the laminar down flow.

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For Class I cabinets the measured face velocity should be between 0.7 m/s and 1.0 m/s at all points. For Class II cabinets this should be not less than 0.4 m/s.

The down flow in a Class II cabinets (not applicable in a Class I) should be between 0.25 m/s and 0.5 m/s.

- Exhaust HEPA filter test

The HEPA filters on the exhaust are there to ensure that any contamination in the airstream is filtered prior to discharge. It is therefore important to check the integrity of the filters to ensure there are no holes and the filter is properly located so there are no leaks around the edges. The test is undertaken by introducing an aerosol challenge to the airstream upstream of the filter and testing to see if there is any penetration downstream.

Filters should have an efficiency of at least 99.995% (or penetration of <0.005%).

- Operator Protection Factor (or KI Discus) Test As part of the inspection, a containment test for operator (user) protection should be undertaken. This is usually by the KI Discus method where an aerosol of potassium iodide is generated within the operating cabinet and sampling devices are placed in front of the cabinet to capture any aerosol escaping from the working area. The operator protection factor (OPF) is defined as the ratio of exposure to airborne contamination generated on the open bench to the exposure resulting from the same disposal of airborne contamination generated within the cabinet.

When tested in accordance with the British Standard all cabinets in use should have an operator protection factor of at least 1.0×10^5 .

Within the CBE the following approaches should be taken:

- All cabinets must have an operator protection (KI Discus) test included as part of the commissioning process for new or relocated cabinets.
- All cabinets must be tested for operator protection (KI Discus test) on an annual basis, or every six months if in Containment Level 3 facilities.
- Operator protection tests are to be carried out in such a way as to ensure the cabinet and the laboratory are as representative as possible of normal working conditions, that is
 - a. With any air conditioning units or other ventilation systems in the laboratory switched on;
 - b. With other safety cabinets and fume cupboards within the laboratory switched on;
 - c. With the cabinet loaded with a typical arrangement of equipment and samples;
 - d. With a person moving around the laboratory, particularly if any pedestrian traffic is near the cabinet;
 - e. With doors (laboratory, nearby incubators and fridges etc) being opened and closed.

Copies of KI Discus test certificates must be kept for at least 5 years (a requirement under the COSHH Regulations).

Version 002

Effective Date: 7th July 2020

Review 7th July 2022

Written by: P.Hourd	Reviewed by: A.Chandra	Approved by: R.I.Temple
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Standard Operating Procedure

SOP105

Title: USE AND MAINTENANCE OF THE FASTER BSC-G 2000 BIOLOGICAL SAFETY CABINET (DUCTED)

Location: CBE Tissue Engineering Laboratory (T208B)

Version 002

Effective Date: 7th July 2020

Review 7th July 2022

Written by: P.Hourd	Reviewed by:A.Chandra	Approved by: R.I.Temple
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