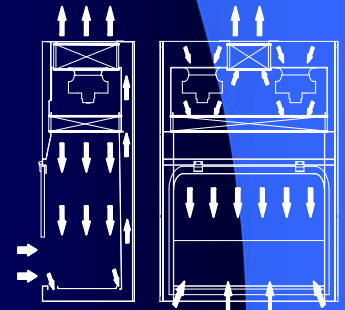


Research Laboratories & Biological Containment For Project Managers



Dr Martin Vinnell
Director of Health & Safety
UBSS Safety Adviser



Health and Safety at Work Act



MHSAW Regulations



CoSHH

Manual Handling Confined Spaces

Electricity

Radiation

LEV

PPE

DSE (Workstation)

GM

Noise

Lead

Asbestos

Workplace

Heights

The HSE The EA The Home Office DEFRA Local Authorities

CTSAs

Councils (District and Parish!), water, landfill, **Police**

Antiterrorism Crime and Security Act

Requires notification to the Home Office and secure storage of all Hazard Group 4 agents, some HG3 agents and some toxins, as well as the genetic material associated with the virulence of a listed pathogen or toxin.

This can have PROFOUND and SERIOUS consequences for Laboratory design and build (and increased costs) – get Dave Corcoran (Security Office) involved very early if Schedule 5 items are going to be used.

What are you talking about??!

Hazard Group
(of pathogens)

1 2 3 4

Containment Level
(for Human H & S)

1 2 3 4

ACDP or ACGM

Containment Level
(for Animal and Environment)

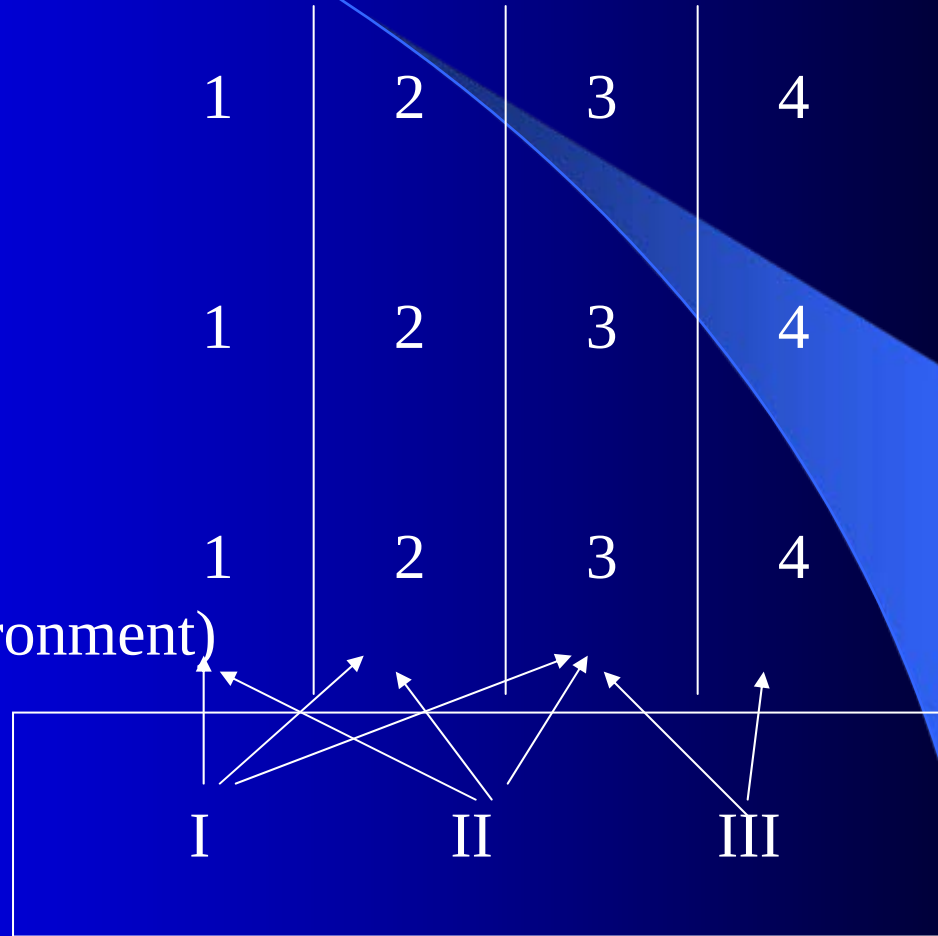
1 2 3 4

SAPO or DEFRA

‘CLASS’
(of Safety Cabinets)

I II III

PLANT and ANIMAL Containment Level (high/low)



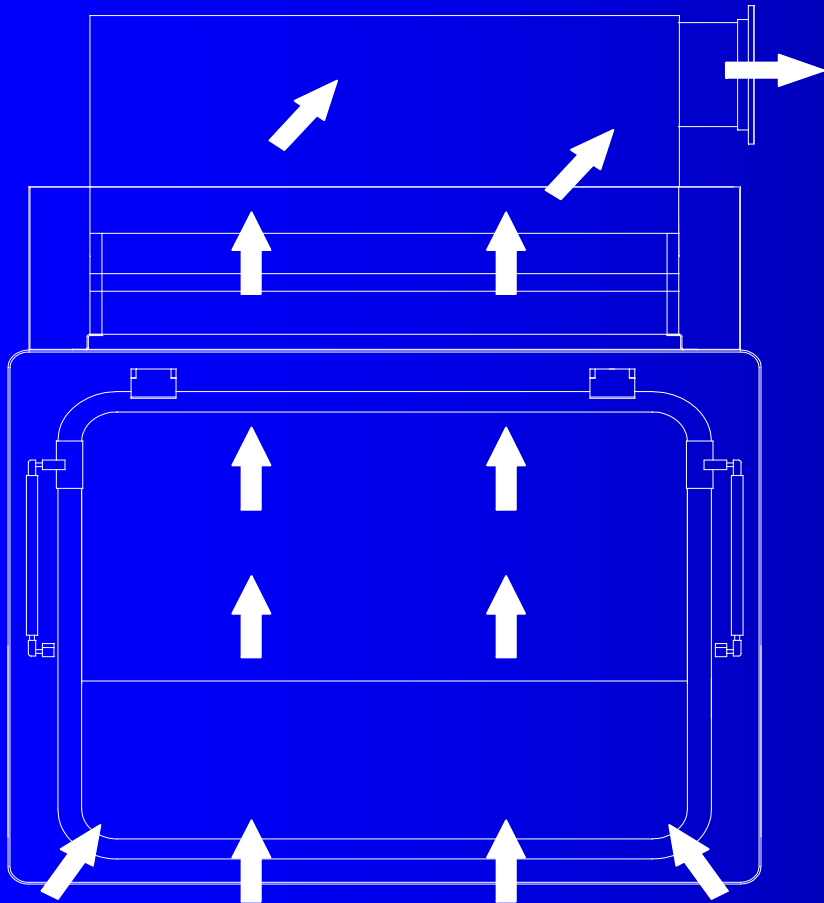
The terminology – ‘Safety’ Cabinets

This is one of the most common mistakes made -

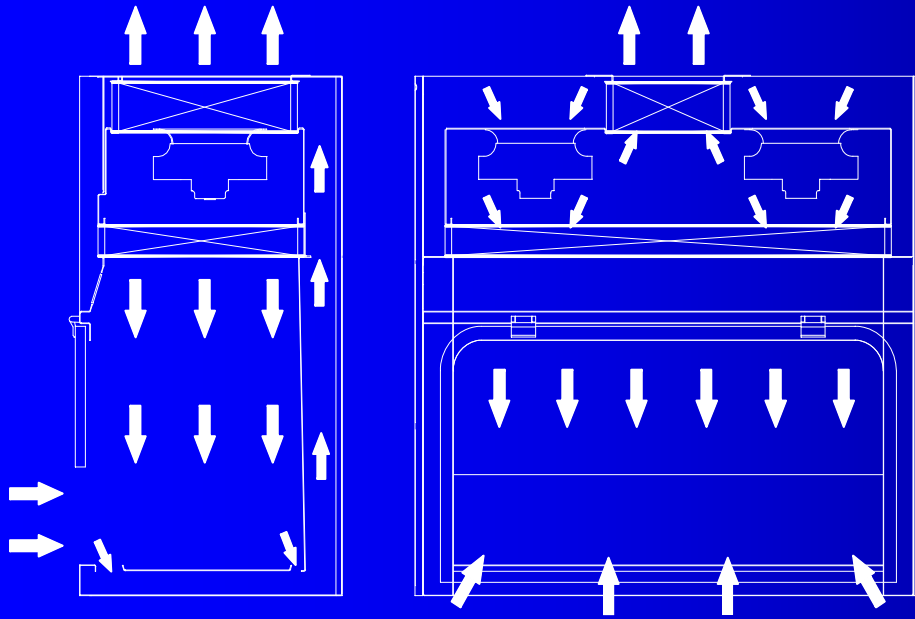
Tissue Culture Hood Laminar Flow
Glove Box Isolator Fume Hood
Hoods Cabinets

Microbiological Safety Cabinet Class I, II or III
Horizontal Laminar Flow / Vertical Laminar Flow
Isolators Fume Cupboard

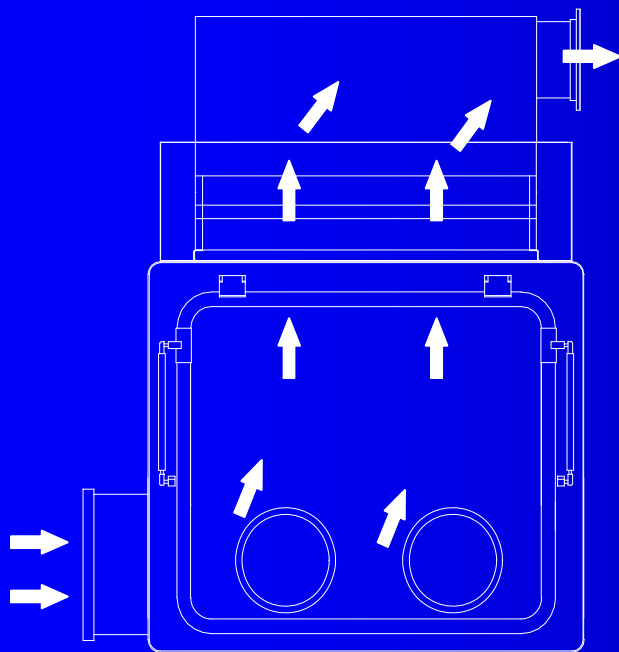
CLASS I Microbiological Safety Cabinet



Class II Microbiological Safety Cabinet



Class III Microbiological Safety Cabinet

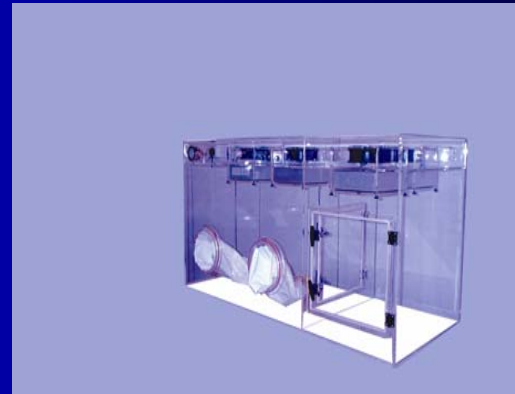


Class III

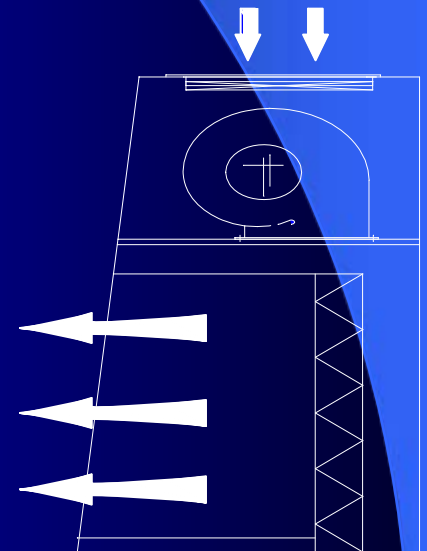


**Class III / I
hybrid**

ISOLATORS



VLF and HLF



Types of MSC continued.....

Recirculatory (BS5726 and Cambs Uni' state DOUBLE HEPA)

Externally Ducted (direct/sealed connection)

Thimble Extract

These have little effect on 'Biological Safety' – but relate to ability to fumigate the cabinet.

Figure 4.

Thimble unit for ducting a Class II, Type A BSC.

A. balancing damper

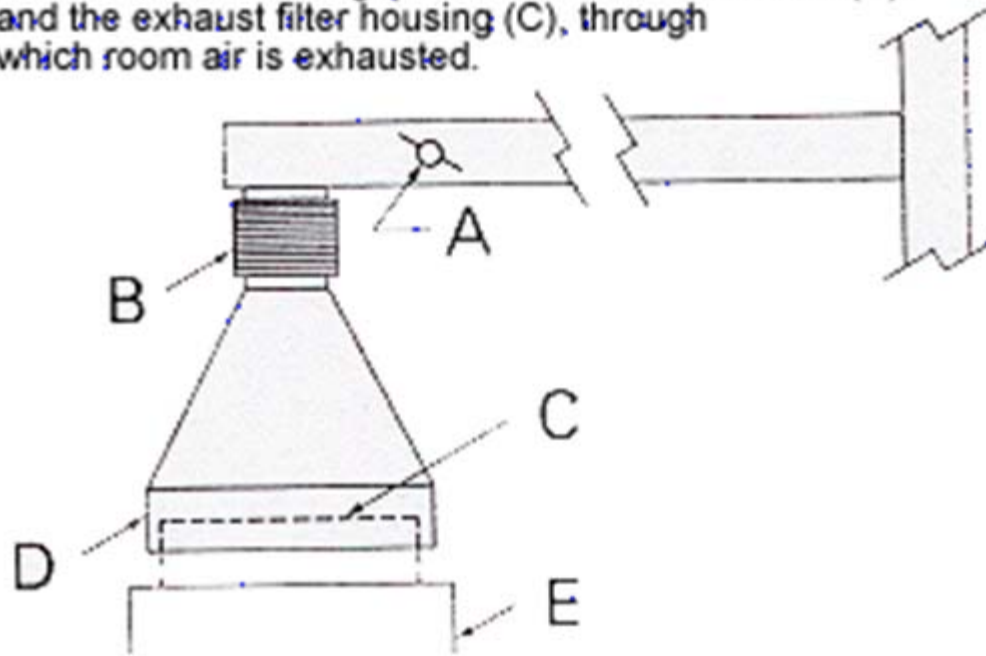
B. flexible connector to exhaust system

C. cabinet exhaust HEPA filter housing

D. thimble unit

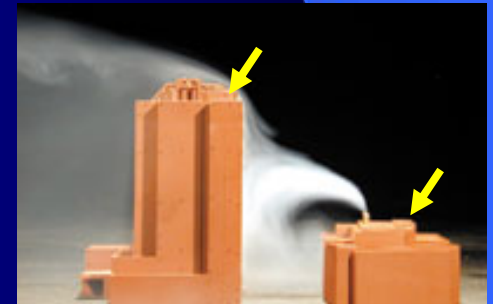
E. BSC

NOTE: There is a 1" gap between the thimble unit (D) and the exhaust filter housing (C), through which room air is exhausted.



EXAMPLE!! - 'Thimble Extract'

Fume Hoods/Cupboards



Okay, if it is safe –

Why use a Permit to Work?

1. Where Fume Stacks are used as a **disposal route** for vaporous chemicals (e.g. Chemistry Department)
2. Fuel Exhaust stacks/chimney
3. Radioactive exhausts
4. To limit exposure to accidental release



‘Containment Level’ of Laboratories:-

CL1:- easy to clean, impervious resistant surfaces, disinfectants to hand, minimise aerosols, door shut during work. GLP - lab coats and PPE, no mouth pipetting, eating etc etc, hand wash sink, safe disposal routes

& in addition to the above....

CL2:- authorised access only, specified disinfection procedures, safe storage of biological agents, work producing aerosols must be in MSC, access to incinerator for some bio waste, 24m³ space per person, autoclave, negative airflow during work if possible

‘Containment Level’ of Laboratories:-

& in addition to the above....

CL3:-

Must be maintained at negative pressure, sealable for fumigation, & extracted air must be HEPA filtered.

Must be separated from any other activities in the building.

Secure access & list of authorised personnel posted on entrance.

Observation window.

Laboratory to contain its own equipment & autoclave.

Impervious floor as well as benches.

Written contingency plans in case of spillage.

Written training records.

CL4:- The University have no CL4 labs.

FUMIGATION / FOGGING

Required under CoSHH/LEV/GM/DEFRA/SAPO etc etc.....

....of Rooms (CL3 for Human Health & Safety)

....of MSC's (all Containment Levels for Human Health & Safety)

.....of equipment/pass-through chambers/animal units (for maintained sterility and animal health)

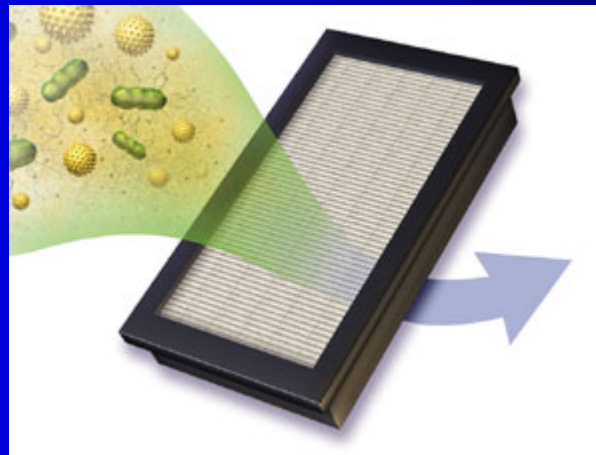
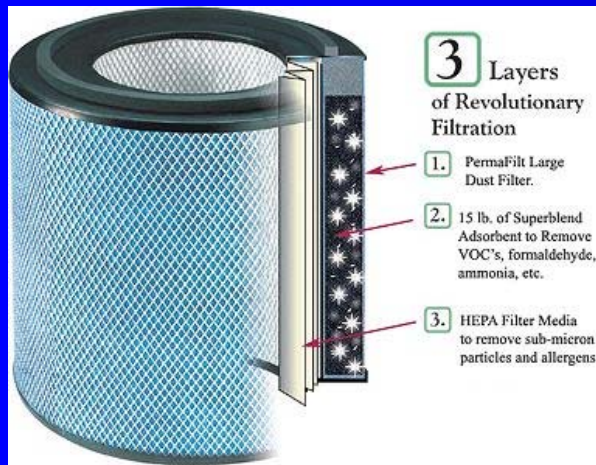
How? By Formaldehyde?

By Hydrogen Peroxide

By Chlorine Dioxide?

At Containment Level 3

HEPA Filters



Management of Containment Level Facilities:-

Control:-

Clear idea of management structure – who reports to whom?

This is especially important where facilities are shared with NHS or an external company.

Information and Training:-

Workers need to know what they can or can't do.

Local Rules & Standard Operating Procedures.

Management of Containment Level Facilities:-

Access Control & Security:-

Only authorised personnel are allowed access to CL2 & CL3.

Signage for CL2

Keypad locks or proximity cards for CL3.

Remember secure storage of samples.

Maintenance:-

Will be required, adequate control of contractors in the facility by “permit to work” system.

HEPA filters, autoclaves, negative pressure regimes & alarms, integrity of seal for fumigation, all need to be tested and recorded.

Risk assessments will be required for these events.

