BUYER'S GUIDE

Choosing a biosafety cabinet

Class I, Class II or Class III? How to pick the right cabinet for your work, your room and your budget.



INSIDE

1. The classes compared
2. Which class you need
3. Room and install checks
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INNOVATION IN ACTION

Three classes, three different jobs

Every biosafety cabinet protects the person using it. The classes differ in whether they also protect the sample, where the filtered air goes and how sealed the work area is. Pick the class from your risk assessment first, then the size and options.

	Class I	Class II A2	Class II B2	Class III
Protects you	**Yes**	**Yes**	**Yes**	**Yes**, fully sealed
Protects the sample	**No**	**Yes**	**Yes**	**Yes**
Protects the room	**Yes**, filtered exhaust	**Yes**, filtered exhaust	**Yes**, filtered exhaust	**Yes**, filtered in and out
How the air moves	Room air is drawn in past you, through a HEPA filter and out.	Filtered air flows down over the work. About 70% recirculates, 30% is exhausted.	Filtered air flows down over the work. All of it is exhausted to outside.	Gas-tight box under negative pressure, worked through glove ports.
Front opening	Open front, inflow 0.7 to 1.0 m/s	Open front, inflow at least 0.4 m/s (TION: 0.5 m/s)	Open front, inflow at least 0.4 m/s (TION: 0.5 m/s)	No open front
Ducting	Often ducted to outside	None needed, exhausts back into the room	Always hard-ducted with its own extract fan	Always ducted
Typical work	Infectious specimens where the sample needn't be protected	Cell culture, clinical, molecular and most CL2 and CL3 work	Biological work that also uses volatile toxic chemicals or radionuclides	Hazard Group 4 agents at CL4

Inflow figures are the BS EN 12469 requirements for each class. TION builds Class II A2 and B2 cabinets.

UK labs work in containment levels, not BSL numbers

The work is set by the ACDP hazard group of the agent (1 to 4) and the lab's containment level (CL1 to CL4). Your COSHH or biological risk assessment, signed off by your biological safety adviser, decides the cabinet class. US guides use BSL-1 to BSL-4, which map roughly onto the same levels.

Which class do you need?

Answer three questions in order. Most UK labs end up with a Class II A2.

1 Will you handle Hazard Group 4 agents, or does your risk assessment call for a fully sealed barrier?

YES → **Class III**
Sealed glovebox, specialist build

↓ **No**

2 Does the sample need protecting from contamination? For example cell culture, sterile preparation or PCR set-up.

NO → **Class I may do**
Protects you, not the sample. Often ducted.

↓ **Yes**

3 Will you use volatile toxic chemicals or radionuclides inside the cabinet, beyond trace amounts?

YES → **Class II B2**
Fully exhausted, hard-ducted to outside

↓ **No**

Class II A2, recirculating

No ductwork, quickest to install, lowest cost. The right choice for most CL2 and CL3 biological work.

Only small amounts of volatile chemicals? Some labs run an A2 with a canopy (thimble) connection to an extract system. Agree this with your safety adviser before you buy.

Two cabinets that are not biosafety cabinets

Laminar flow cabinet

Blows clean air across the sample and out towards you. It protects the sample only. Never use one for infectious material.

Fume cupboard

Built for chemical fumes, not microbes. It protects you but not the sample. If your work is chemical only, this is what you need.

Check the room before you order

A cabinet that fights the room won't contain properly. These six checks catch the problems that delay most installs.

Getting it in

Measure doorways, corridors and lifts on the delivery route. Most cabinets are 800 mm deep and 915 to 1830 mm wide. Compact models are 680 mm deep.

Where it sits

Keep it away from doors, walkways, windows and supply air diffusers. Draughts across the front opening can pull air out of the cabinet. BS 5726 gives the UK siting guidance.

Height

A standard A2 on its stand is about 2.2 m tall. Leave space above it so engineers can reach the exhaust filter for testing.

Power and services

Plan a dedicated socket. If you want gas, vacuum or nitrogen taps, or a sink, agree them now. They're far easier to fit at the factory than on site.

Ducting (B2 only)

A B2 needs its own extract duct and fan, a route to atmosphere and duct kept under negative pressure. It removes room air all the time, so check the room's make-up air too.

The people using it

Long sessions need the right working height, knee space and seating. Manual or electric height-adjustable stands help when several people share one cabinet.

What installation looks like

CLASS II A2	CLASS II B2
About 1 day	**2 to 7 days or more**
No ductwork. Position, level, connect power, then commission and test on site.	Ductwork, extract fan and controls go in first. Time depends on the duct route and the building.

Eight questions to put to any supplier

Two cabinets can look the same on a datasheet and behave very differently in use. These are the points that separate them.

1. What is it tested to?

Ask for type testing to BS EN 12469 and for the on-site commissioning results, including the KI-Discus containment test.

2. Which filters?

HEPA H14 or ULPA H15 (99.9995% at 0.1 µm). Every cabinet should have a downflow and an exhaust filter. Expect them to last 3 to 5 years.

3. How does it warn you?

Look for live inflow and downflow monitoring with twin sensors, plus audible and visual alarms that can't be missed from across the lab.

4. What happens at the sash?

The cabinet should alarm when the sash rises above its safe working height. On TION Class II models that height is 200 mm.

5. How loud is it?

Ask for the dB figure at your size. TION A2 cabinets run below 63 dB. It matters when someone sits at it all day.

6. What is it made of?

Check the body for corrosion risk from disinfectants. Ask about 304 or 316 stainless work surfaces, or metal-free if metals affect your work.

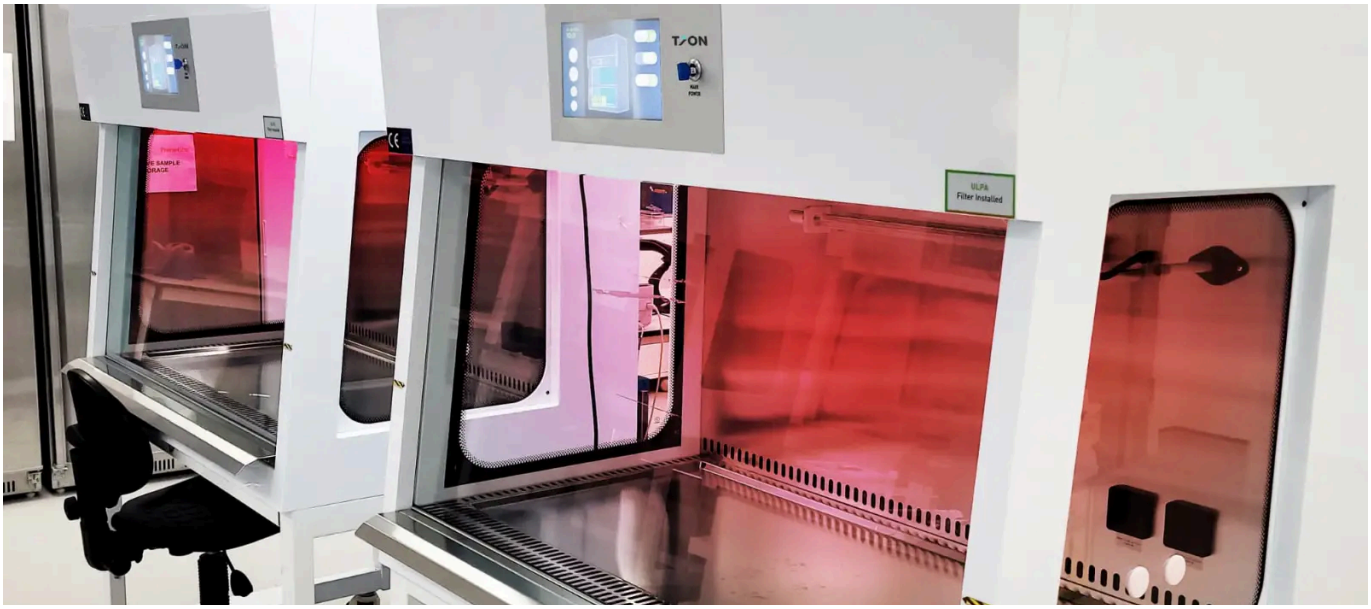
7. How is UV handled?

A germicidal UV lamp (254 nm) should only run with the sash closed, on a programmable timer.

8. Who services it?

Test at least once a year, never more than 14 months apart. Filter changes and moves need decontamination first. Ask who does both.

Below: TION Class II cabinets in alarm. When airflow drops out of range the interior light switches off and a red beacon shows, so no one keeps working in an unsafe cabinet.



What it costs and how long it takes

CLASS II A2

£4,000 to £8,000

Per cabinet, depending on size and specification.

CLASS II B2, DUCTED

Significantly more

Plus ductwork, extract fan and a longer install. Priced to your building.

Lead time

TION keeps A2 cabinets in UK stock. Delivery, installation and commissioning within 7 days. Bespoke designs take longer.

Running costs

Annual testing and certificate. New filters every 3 to 5 years, with decontamination. Eco mode cuts power use when idle.

6. Buying checklist

Tick these off before you sign an order

- [ ] Risk assessment done and cabinet class agreed with your biological safety adviser
- [ ] Workspace width chosen (internal widths run from about 720 to 1745 mm)
- [ ] Delivery route measured: doors, corridors and lifts
- [ ] Position checked against doors, walkways, windows and air diffusers
- [ ] Ceiling height checked, with room above for filter testing
- [ ] B2 only: duct route, extract fan and make-up air agreed with estates
- [ ] Filter grade chosen: HEPA H14 or ULPA H15
- [ ] Options listed: taps, sink, UV, shelves, stand type
- [ ] Commissioning tests and certificates included in the price
- [ ] Annual testing and decontamination arranged, with a named service provider

TION

The TION Class II range

A2 recirculating	Our standard cabinet. 915 to 1830 mm wide, ULPA H15 filters.
A2 metal	Epoxy-coated steel body, 304 stainless interior, HEPA H14.
A2 metal-free	Polypropylene work surface for metal-sensitive work.
A2 Essentials Compact	800 to 1800 mm wide, 680 mm deep, for tight rooms.
B2 ducted	Fully exhausted to outside for chemical or radionuclide use.



One accountable party

We design the cabinet and its control system, so there's one team to call.

Our own engineers

Fully trained aftersales engineers commission, test and service what we install.

Designed around your process

Sizes, taps, sinks, glove apertures and stands to suit the work, with no bespoke design fee.

Red-light alarms as standard

Twin airflow sensors, sash alarms and a lockable touch-screen controller on every cabinet.

ISO 9001 · ISO 14001 · SafeContractor approved

Not sure which cabinet fits?

Send us what you'll be working with and a photo or plan of the room. An engineer will come back within one working day with a recommendation and a price range.

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Email support@tion.co.uk
Web tion.co.uk/core/biosafety-cabinets

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