

FREE TECHNICAL GUIDE

When does a fume cupboard need a scrubber? A guide for labs and estates

Which acids and volumes need scrubbing, how a scrubber affects face velocity and fan duty, where it can go, and what to plan for maintenance.

For
Lab and technical
managers

And
Estates and
facilities

Covers
Universities and
labs





The fume cupboard protects the user. The scrubber protects everyone else.

A fume cupboard takes fume away from the person working at it. Without a scrubber, the extract carries that fume through the duct, the fan and out of the stack, often close to air intakes and windows.

Who it is for

Lab managers, technical managers and estates teams planning new fume cupboards, refurbishing extract, or dealing with corroded ducts and fans.

How to use it

Read it at the start of a project, before the extract system is fixed. The checklist on the back page lists what a supplier needs.

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FIVE THINGS TO GET RIGHT

- 1 List the methods**, not just the acids.
- 2 Design the scrubber with the fan**, so face velocity holds.
- 3 Plan the space and access** before the building is finished.
- 4 Keep perchloric separate**, always.
- 5 Build the scrubber into** your LEV examination and service plan.

01 Signs your extract needs scrubbing

There is no single threshold. These are the signs that a fume cupboard extract should be scrubbed.

SIGN	WHY IT MATTERS
Regular acid digestions	Nitric, HCl and sulphuric digestions put a steady acid load into the duct
Any routine HF work	HF is highly toxic and attacks glass; it should not leave the stack untreated
Stack near intakes or windows	Discharged fume can be drawn back into your building or a neighbour's
Corroded ducts, dampers or fans	The acid load is already damaging the extract system
Visible fume or complaints	Fume is leaving the stack at concentrations people notice
Planning or permit conditions	The site has been told to control emissions from lab extract

PERCHLORIC ACID

Perchloric work needs a dedicated wash-down fume cupboard and extract. It is never connected to a shared scrubber, because perchlorate deposits can be shock-sensitive.

IN PRACTICE

Walk the extract route

Look at the duct, dampers and fan for corrosion or staining. They show what the extract is carrying.

List the methods

A list of methods run in each fume cupboard tells a supplier far more than a list of chemicals in the store.

QUESTIONS TO ASK A SUPPLIER

Q1 Which of our methods drive the scrubber design?

Q2 Should any fume cupboard have its own scrubber?

Q3 How do you treat HF in the wetted path?

02 A scrubber is part of the extract system

Adding a scrubber adds resistance to airflow. If the fan is not sized for it, face velocity drops and the fume cupboard stops protecting the user.

IN Fume cupboards One to four units	01 Ductwork Sized for the flow	02 Scrubber Adds pressure drop	03 Extract fan Sized for the whole system	OUT Stack Clear of intakes
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Size the fan for the system

The fan must overcome the ductwork, the scrubber packing and the mist eliminator together, at the design flow.

Check at commissioning

Measure face velocities with the scrubber running, against the fume cupboard's tested performance to BS EN 14175.

Variable air volume

Where cupboards use VAV control, the scrubber and fan must stay stable across the full flow range.

Fan after the scrubber

Placing the fan downstream keeps the scrubber under negative pressure, so any leak draws air in rather than pushing fume out.

IN PRACTICE

Existing systems

Retrofitting a scrubber to an existing extract nearly always means checking the fan duty, and often means a new fan.

Noise

A larger fan can be louder. Check noise at nearby windows and on the roof as part of the design.

QUESTIONS TO ASK A SUPPLIER

Q1 What pressure drop will the scrubber add at our design flow?

Q2 Is the existing fan big enough, or does it need replacing?

Q3 How will you prove face velocities at commissioning?

Q4 How does the system behave if a fume cupboard sash is closed?

03 Plan the space before the building is finished

Most fume cupboard scrubbers go in a plant room or on the roof, close to the extract fan. Plan for these early.

CONSIDER	WHY
Footprint and height	The scrubber, sump and access around them must fit the space
Delivery route	Doors, lifts and stairs between the loading bay and the plant room
Floor or roof loading	The sump holds liquor; the structure must carry the operating weight
Drain and water	Make-up water in, controlled bleed out to an agreed drain
Frost and weather	Outdoor units need frost protection and weather-proof controls
Service access	Room to calibrate probes, top up reagent and inspect the packing

DUCTWORK MATERIALS

Polypropylene or PVC ductwork suits most acid extract. Where HF or high temperatures are present, check every material in the wetted path, including dampers and flexible connectors.

IN PRACTICE

Involve the design team early

Plant room space and roof loading cost far less to allow for at design stage than after the building is finished.

Bund the liquids

The sump and reagent containers should sit within bunding sized for a leak.

QUESTIONS TO ASK A SUPPLIER

Q1 What footprint, height and operating weight should we plan for?

Q2 How will the scrubber be delivered into the plant room?

Q3 What drain and water connections does it need?

04 Build it into your maintenance plan

Fume cupboard extract is local exhaust ventilation. Under COSHH it must be thoroughly examined and tested at least every 14 months. The scrubber is part of that system.

TASK	WHAT IT INVOLVES
Routine checks	Liquor level, dosing reagent level, alarms and visible leaks
Probe calibration	pH probe checked and calibrated so dosing stays accurate
Reagent and bleed	Reagent topped up; bleed and make-up confirmed
Packing and mist eliminator	Inspected for fouling or scaling; cleaned or replaced as needed
LEV examination	Face velocities and system performance tested and recorded at least every 14 months

SERVICE INTERVAL

The right interval depends on how hard the lab works the fume cupboards. Agree it at handover, and record it in your LEV logbook alongside the examination results.

IN PRACTICE

Train the users

Make sure lab staff know what the scrubber alarm means and who to call.

Keep the logbook together

Record scrubber service visits in the same LEV logbook as the fume cupboard examinations.

QUESTIONS TO ASK A SUPPLIER

Q1 What routine tasks can our technicians do themselves?

Q2 What reagent and spares should we keep on site?

Q3 How will the scrubber be covered in the LEV examination?

05

The checklist for a quote you can trust

Send what you have; an engineer can fill gaps on a call or a site visit. The more of this list you can answer, the tighter the sizing and the fewer surprises at commissioning.

☐ **Methods and acids** used in each fume cupboard

☐ **Extract flow** per cupboard, if known

☐ **Where a scrubber could go:** plant room or roof

☐ **Utilities:** power, water and drain

☐ **Number of fume cupboards** and their sizes

☐ **Existing fan** and ductwork details

☐ **Access routes** for delivery and service

☐ **Any planning** or permit conditions



TALK TO AN ENGINEER

Tell us what your fume cupboards are used for

Send the acids, the number of cupboards and where a scrubber could go. A process engineer will reply within 4 working hours and tell you what will work, before anyone talks about price.

WEB

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