

# 5 Things to Consider When Choosing Fume Cupboards

When acquiring a laboratory fume cupboards there are many factors that should be considered. Here we have focussed on the top five things that we believe should be taken into account.

## 1. Ducted v Ductless

The first choice to make is whether to go ducted or ductless with your fume cupboard. A ductless cupboard takes air into through the front of the unit through a filter (or filters) and then exhausts the air back into the room. Ductless fume cupboards are ideal for applications that are not using very large quantities of chemical and where movability is a consideration. The cost of install is significantly lower than a ducted system but does come with an ongoing cost of replacement filters. The downside is on some occasions a ductless unit is not recommended based on the chemicals and the quantities used. However as environmental control increases more and more people are choosing recirculating (ductless) units as exhausting dangerous chemicals to the air is something everyone is striving to reduce.

Ducted fume cupboards on the other hand take air in through the front of the unit and exhausts the air into the atmosphere. A fan is usually situated on the outside of the building and draws the air up and out. The benefit of a ducted cupboard is that once fitted there is very little maintenance work required and aside from the 14 month required LEV test the ongoing costs are minimal. Often ducted fume cupboards are the way to go when the lab building is still under construction. This allows for duct to be run and fans to be installed without disruption to the lab. Another benefit of ducted cupboards is that the use of chemicals is not restricted by quantity or filter type. This makes ducted units the most versatile in terms of day to day usage.

Expert's opinion: "If you have an existing lab go ductless. Simply because the reduced cost of install will (In most cases) more than offset the ongoing investment in filter replacement. If you are building a new lab (or have easy access to where duct would need to be run) go ducted. It allows for more varied usage and the ongoing costs are minimal."

## 2. Access

What's the available access? It's worth considering the access you have available not only to the lab but also to the building itself. Doorway widths, corridor corners and ceiling heights are all things that should be clearly defined when information is being gathered. If this information isn't provided it can incur unexpected costs when specialist equipment is required. Often if this

information is gathered earlier on manufacturers can build cupboards in a way that will allow access through existing spaces.

Expert's opinion: "If you don't know if you've captured all the information you need....ask! The manufacturer should be able to help you with anything you may have missed!"

### 3. Optimum Size

What size cupboard is perfect for you? Don't think because standard size units are advertised by manufactures that that is all there is available. Specify exactly what you need in terms of dimensions, specification and applications. Maybe you have a specialist piece of equipment you need to fit in the cupboard. Take the dimensions of that unit and share it with the manufacturer. They can build something that will fit your needs rather than just quoting a standard size where space is not optimised.

Expert's opinion: "Write down your perfect specification before looking at what's available on the market. Fume cupboard specialists should rarely have a problem with designing to your spec. You can always scale back from there if what you are looking for is physically not possible. It's worth asking the question!"

### 4. Chemical Assessment

What chemicals will you be using? It's worth knowing what you will be using as there will be some materials in traditional 'standard spec' fume cupboards that react badly to certain chemicals. For example fume cupboard sashes are usually made from a toughened glass. If you are using HF the glass will be etched badly by this. The solution here could be a polycarbonate sash.

Expert's opinion: "Share your list of chemicals and usage quantities with the manufacturer early on in the process to make sure you get the best recommendations possible. They are likely to have a solution for your requirement"

### 5. VAV (Variable Air Volume)

Fume cupboards (particularly ducted) use a lot of energy and can cause huge heat loss due to the sheer volume of air extracted from the room. When a cupboard is installed the face velocity will be set between 0.3 and 0.5m/s with the sash at 'working height'. This means that when the sash is at different heights the face velocity will change to either be higher or lower than this. This is never an ideal situation as when the face velocity drops the safety of the user is a concern. Conversely when the face velocity increases energy loss occurs. VAV or Variable air volume controls the face velocity based on the height of the sash. This not only ensures the safety of the operator at all times but also drastically reduces heat loss. Another benefit is the fan speed is reduced when the sash is lowered which increases its life expectancy. In a busy lab VAV can pay dividends and over time can save show significant savings in heating and energy.

Experts opinion: "Where possible budget for VAV (variable air volume). The additional cost is more than worth it on an item of equipment that is used every day. Particularly on a piece of capital equipment that could be in the lab for many years"