APPLICATION NOTE

Cabinet Selection

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Today there are many types of cabinet and cabinet options. This application note aims to assist prospective buyers determine the cabinet type and options most suitable for their application.

Cabinet Types

Different types of cabinet are designed for different applications. The following table is a guide to the more common cabinets:

Cabinet	Applications	Protection Provided
Laminar Flow Cabinet	Process products and apparatus in laboratory and production facilities. For use with non-hazardous materials.	Product
Class I Biological Safety Cabinet	For use with micro-organisms classified in AS2243.3 as risk groups 2,3 and 4 and which can be deactivated by formaldehyde. No product protection or cross-contamination protection is offered by these cabinets.	Personnel & Environment
Class II Biological Safety Cabinet	For use with micro-organisms classified in AS2243.3 as risk groups 2,3 and 4 and which can be deactivated by formaldehyde.	Product, Personnel & Environment
Recirculating Fume Cabinets	For use with small to medium volumes of toxic, corrosive or flammable chemicals. Can be fitted with HEPA filters for use with dusts or powders. Cabinets can be mobile. Not to be used for perchloric acid.	Personnel & Environment
Ducted Fume Cupboards	For use with toxic, corrosive or flammable chemicals. A scrubber may be required for high volume work. Fixed installation (ducting etc.) into the building is required. Provision for exhaust make-up air should be made in the ventilation system.	Personnel (Environment if a scrubber is fitted)
Cytotoxic Drug Safety Cabinets	Cytotoxic drugs and other toxic chemicals or micro-organisms which cannot be deactivated by fumigation.	Product, Personnel & Environment
Isolator (Glovebox)	There are many types of isolator. Isolators can provide class III protection. Isolators can be used for cytotoxic drugs and other toxic chemicals or micro-organisms which cannot be deactivated by fumigation.	Product, Personnel & Environment

Laminar Flow Cabinet Airflow Direction

Laminar flow cabinets are available with horizontal (cross-flow) or vertical (downflow) of filtered air. The air cleanliness in the work-zone is the same for both types. Horizontal airflow cabinets are more common in New Zealand.

Vertical flow cabinets have the advantage that they do not blow air directly into the face of the operator. They can be configured for use from both sides in non-critical applications. They may provide a better orientation of some items, such as very large open containers, to airflow. They can be fitted with clear sides and so are often preferred in teaching applications. Some cabinets operate with an inward airflow and thus offer some personnel protection.

However, vertical flow cabinets are typically more costly than horizontal flow cabinets and have hard-to-clean areas. They are more difficult to use when placing or removing equipment or materials and are ergonomically inferior for routine manipulations, as users have to reach behind a window. They typically suffer from some air turbulence at the level of the work surface.

Recirculating Fume Cabinets and Ducted Fume Cupboards

Recirculating fume cabinets are not recommended for applications involving high vapour loads such as heating and evaporating solvents. But for low-medium use applications, both technologies can be used, and both have advantages.

The installation cost may be lower for either option depending on the difficulty of installation of the ducted system. The annual operating cost may be lower for either option depending on the replacement rate of the filters in the recirculating cabinets compared with the cost of conditioned air exhausted through the ducted fume cupboard. Fume cupboards require less attention from the user, whereas recirculating fume cabinets can be mobile.

Cabinet Options

Size: Consider the process to be contained in the cabinet and how may people are going to be working in the cabinet at one time. Unless space is at a premium, select cabinets around 120cm wide for single-operator applications and 180cm for two operators. Concern regarding operator-produced air turbulence may limit the application of 180cm cabinets in work with high-risk organisms. Make sure you can get the cabinet into your room!

Stand: Some cabinets are designed to sit on a bench or stand. If the cabinet is to sit on a bench, make sure the bench can safely support the weight. Some cabinets are very heavy! Make sure you order a stand if a suitable bench is not available.

Services: If the process in the cabinet may need a supply of power or gas or vacuum, order appropriate fittings. Having leads or tubes hanging out the front of a cabinet will compromise the function of the cabinet.

UV lamps to sterilise the work surfaces of cabinets are recommended for biological safety cabinets.