



**\*Suggested Specification For Johndec Safetyflow Fume Cupboard  
fitted with a Johndec Fe2000 Fume Control System**

**General**

Fume Cupboard(s) shall be manufactured by Johndec Engineering Plastics Pty Ltd 45 Attwell Street, Landsdale, Western Australia 6065. The fume cupboard(s) shall be of aerodynamic bench type and be manufactured in accordance with this specification and comply with the following Australian Standards AS 2243.8, AS 3000, AS 2430.3.6. Appendix 'A' and AS 1482.

**Workshop Drawings**

The supplier for approval prior to manufacture shall produce workshop drawings of the fume cupboard(s) and its variants to be supplied under the contract. Wiring diagrams of the operating and safety equipment installed within the fume cupboard shall also be provided. Adequate time for approval process and integration of resulting minor alterations shall be allowed so that the construction programme will not be adversely affected.

**Materials Of Manufacture**

The interior and exterior of the fume cupboard(s) shall be manufactured from industrial quality.

**Option 1.** Fire retarded U.P.V.C. And fully comply with Australian Standard AS 1530 Part 3.

**Option 2.** Fire retarded Polypropylene and fully comply with Australian Standard AS 1530 Part 3.

All interior and exterior surfaces of the fume cupboard(s) shall be white, except the light diffuser panel, which shall be translucent.

All joints shall be heat welded by forming a vee and filling with a minimum of three runs of compatible weld material applied with industry standard plastics welding equipment.

All joints exposed to the view of within the air stream shall be scraped flat and buffed and polished to produce a neat homogeneous finish.

The Structure shall be reinforced where necessary; however, any reinforcement shall not interfere with the airflow through the fume cupboard(s).

Where bolted joints are required, polypropylene bolts shall be used. No penetrations for fixing shall be made through the wall of the work zone.



## **Dimensions**

The fume cupboard(s) shall have the following outside dimensions: -

1. 1200mm wide x 750mm deep x 1500mm high
2. 1500mm wide x 750mm deep x 1500mm high
3. 1800mm wide x 750mm deep x 1500mm high
4. 2000mm wide x 750mm deep x 1500mm high
5. 2400mm wide x 750mm deep x 1500mm high
6. 3000mm wide x 750mm deep x 1500mm high

OR

As listed in the schedule of performance – Fume Cupboards.

## **Base**

The entire base of the fume cupboard chamber shall be a single piece, fully moulded UPVC or Polypropylene section, incorporating a full width runnel to rear with trapped plumbing outlet. The base shall have a grade of 1:50 fall towards the rear runnel.

A removable 16mm thick heat & chemical resistant Labform base shall be fitted into the fume cupboard base to provide a horizontal work surface. Raised indents in the base shall provide support for the work surface and clearance for ventilation underneath and should also serve as a liquids catchment area. The base shall be formed to provide a service shelf at work surface height, to the left and right hand sides of the cupboard.

The front of the fume cupboard base shall have a 45mm high minimum full width, anti-splash sill formed to retain liquids accidentally spilt in the fume cupboard as required by AS2243.8. The front anti-splash sill shall be contoured to minimize airflow disturbance into fume cupboard.

## **Additional Sink (\*Optional)**

An additional sink shall be moulded into the standard full width concealed sump Measuring x x mm deep. The removable Labform base shall be cut to expose sink, then rebated to accept a replaceable cover to maximise workspace when sink is not in use.

## **Chamber**

The chamber shall have an aerodynamically shaped roof that is contoured towards a rectangular extraction outlet to assist in an even extraction rate across the width of the opening. It shall have radius corners and shall not contain fixing bolts.

## **Front Facia**

The fume cupboard front facia shall be aerodynamically shaped to ensure an even and undisturbed airflow into the chamber.



## **Sash**

The counter-balanced sash window shall be of the vertically sliding type supported on stainless steel wire rope and running on two polypropylene ball bearing pulleys.

The sash counter-weights shall run inside a fully enclosed profile section. The sash window shall be 6mm armour plated glass complete with 2 only moulded 'D' handles.

The sash runners and channels shall have seals to ensure they are completely airtight and a minimum opening of 50mm should remain when the sash is fully lowered. All materials used in the construction of the sash shall be acid and alkali resistant.

## **By-Pass**

The fume cupboard(s) shall be fitted with an air by-pass system fixed to the front facia, to control the velocity at the lower sash position. With the sash fully raised, the by-pass system is completely sealed off to give all the available extraction through the sash opening for maximum safety. The extraction rate from the fume cupboard shall remain constant irrespective of the position of the sash.

### Please Note: -

The above by-pass system is not required if fume cupboard(s) are to be fitted with the Airconserver Modulating Damper System or variable volume control system.

## **Baffles**

The fume cupboard(s) shall incorporate a full width duct at rear, with three fixed baffles positioned to provide maximum air control to the face of the fume cupboard. The top and bottom baffles shall include an adjustable baffle providing a gap of 0-20mm. All baffles shall be fixed with polypropylene bolts and shall be easily removable for cleaning.

## **Lighting**

The lighting within the fume cupboard shall be a twin fluorescent unit capable of providing illumination at the work surface of a minimum of 400 lx. The light shall be located outside the fume cupboard working chamber behind a translucent panel, which shall be welded flush into the top of the work zone. The light shall be installed away from the translucent panel to avoid heat transfer to the panel causing distortion.

The light shall be accessible for servicing and shall be connected by a cord and three pin plug, so that it can be completely removed as a unit for servicing.

## **Support Frame (\*Optional)**

The fume cupboard(s) shall be supplied with a purpose made support frame.



Type 1 (open style frame)

Powder coated 38 x 38 square hollow section support frame complete with adjustable feet and a UPVC/polypropylene facia fitted to front of frame for mounting remote valves for services and GPO's where fitted.

OR

Type 2 (fully enclosed type frame)

Powder coated 38 x 38 square hollow section support frame, being fully enclosed with UPVC/polypropylene incorporating: -

1. Sliding doors fitted to front of frame complete with 'D' handles.
2. Removable UPVC/polypropylene base tray.
3. Fixed UPVC/polypropylene panels fitted to sides and back of frame.
4. Fixed UPVC/polypropylene facia for mounting of remote valves for services and GPO's where fitted.
5. Adjustable feet.

**Plumbed Services**

The fume cupboard(s) shall be fitted with the following remotely controlled services: -

Cold water, hot water, natural gas, vacuum, compressed air, nitrogen, etc...

OR

As listed in the schedule of performance – Fume Cupboards.

The service outlets shall be fitted internally on the side service sills of base, to preserve the uncluttered work surface. The remote valves shall be fitted on the front facia of the fume cupboard support frame.

The service outlets and remotes fitted within the fume cupboard(s) all shall have an electrostatically applied epoxy finish, with the outlet and remote being matched in colour. Service identification shall conform to AS 2700.

The fume cupboard(s) shall be totally factory pre-plumbed and pressure tested to ensure no leaks are encountered on site. Provide service tails for site plumber to connect to from main supply.

**Spray Bar**

The fume cupboard(s) shall be fitted with a rear baffle wash down spray bar. The spray bar shall be solenoid controlled and operated via the fume cupboard control system, with the provision of setting the spray bar to operate manually, auto post purge or both the above.



## **Electrical Services**

The fume cupboard(s) shall be fitted with the following electrical services: -

- 10 Amp single GPO
- 10 Amp double GPO
- 15 Amp single GPO
- 15 Amp double GPO
- 10 Amp single GPO with RCD protection
- 10 Amp double GPO with RCD protection
- 15 Amp single GPO with RCD protection
- 15 Amp double GPO with RCD Protection

**OR**

As listed in the schedule of performance – Fume Cupboards

### **(\*Optional)**

All GPO's fitted on fume cupboard(s) shall be fitted within a weatherproof GPO enclosure.

### **(\*Optional)**

Rubber star cut cable entry glands shall be fitted to fume cupboard(s) sidewalls to enable exit of power leads from electrical equipment used within fume cupboard, providing an uncluttered work surface.

The GPO's shall be fitted to the front facia of the fume cupboard support frame.

## **Fume Cupboard Control System**

The fume cupboard(s) shall be fitted with a Johndec Fume Control System Fe2000, a failsafe electronic, programmable P.C.B. module containing 20 x 2 character liquid crystal back lit display (LCD) showing full status of fume cupboard and alphanumeric messages highlighting critical safety issues to the operator. The control system shall contain all switches and timers to enable the fume cupboard to comply with AS 2243.8, AS 3000, AS 2430.3.6 Appendix 'A' and AS 1482.

The fume cupboard control system shall be a compact intelligent microprocessor module with built in adjustable pressure switch in the event of extraction failure the control system will activate a 75dB alarm and graphic warning display on the LCD, and will turn off power and gas supplies via contactor and solenoid valve. The software stored in the unit EPROM and hosted by the microprocessor shall control all other functions.

The control system shall incorporate pre purge, post purge, emergency isolation via a red mushroom headed button of services to comply with AS 2243.8, AS 3000 & AS 2430.6.3. Light, fan, spray bar, scrubber pump, fan boost, door control and commissioning programme.



A battery backup supply shall be contained within the control module. On power failure the device shall automatically time the length of the power failure. If the fan is in pre purge, normal operations or post purge mode it shall automatically restart the fan, sound alarm and indicate the length of power failure.

A full diagnostic and set-up menu shall be provided for commissioning and testing of fume cupboard.

In an event of extraction failure or over temperature should arise, the control panel shall automatically execute its emergency shut down sequence. It will isolate the gas and power while allowing the exhaust fan to continue operating as required by AS 2243.8 thus setting the fume cupboard into a safe mode. At the same time the panel shall activate an audible and visual alarm with the offending item shown on the (LCD).

The control system shall also incorporate a thermal detector, the detector shall be set to activate at a temperature of 50 degrees Celsius.

Activation of the detector shall initiate the following functions: -

1. Activate solenoid valve controlling the spray bar fitted with fume cupboard.
2. Isolate any piped flammable gases to the fume cupboard.
3. Provide fire alarm signal.
4. Start the fume cupboard exhaust fan (if not already operating).

### **(\*Optional)**

A RS485 communication channel shall be incorporated within the control module for communication between external data terminal and computer. This shall allow remote control of the control module and retrieval of the status of the fume cupboard. This shall allow the maximisation of energy saving features, reporting to central data logging devices, access by building management systems, remote emergency shutdown or start-up, reporting the sash position of fume cupboard and delivering a signal proportional of the air volume passing through the fume cupboard. Therefore allowing the air-conditioning within in the room to adjust and deliver the required air volume.

### **Prewiring Of Fume Cupboard**

The fume cupboard manufacturer shall completely pre-wire the fume cupboard including all lights, G.P.O., solenoids, relays, timers and alarm system.

All the above shall be pre-wired to an electrical control box located on top of fume cupboard, which shall house labelled terminal strip, fan contactors, relays and overloads required.

Labelled terminals shall be provided for site wiring by others for the electrical supply to fume cupboard and wiring for extraction fan.



## **Performance**

The fume cupboard shall exhibit the following performance characteristics when tested as specified.

Total exhaust air from the fume cupboard shall be as nominated for the associated exhaust fan.

With the sash door fully open the average face velocity shall be 0.5 metres/sec for the opening at the maximum fan speed.

With the sash door fully closed to a position of 50mm above the front sill, the average face velocity shall be 0.6metres/sec for the opening at the maximum fan speed.

The noise level of the fume cupboard shall not exceed 62dBA when measured on the centre line and one metre away from the sash.

## **Face Velocity Test Method**

The face velocity test shall be carried out in accordance with AS2243.8 Appendix 'E' with final test reports being submitted to the client.