



# CHEMFREE 2000

LABORATORY  
FUME  
CUPBOARDS



## FUME CUPBOARDS CHEMFREE

### FOREWORD

Faster have designed and manufactured CHEMFREE 2000 fume cupboards using the latest molecular filtration technology.

This provides a safe working environment together with fume containment for protection from chemicals, vapours and aerosol in the laboratories.

CHEMFREE 2000 fume cupboards are available in two different versions:

- ✓ CHEMFREE 2000 "S" series fume cupboards meet all routine requirements.
- ✓ CHEMFREE 2000 "M" series units have additional microprocessor control.

This ensures that all functional and operational parameters are monitored, facilitating the correct operation of the fume cupboards.



### CHEMFREE 2000 "S"

- High level of protection from toxic vapours
- High level of filtration efficiency
- Large adsorption capacity
- Filter monitoring systems
- Ductless
- Low cost

### APPLICATIONS

CHEMFREE 2000 fume cupboards are used for the containment and removal of toxic vapours and aerosol, providing operator safety in a wide range of disciplines.

Applications for CHEMFREE 2000 fume cupboards may be found in many laboratories, including those in clinical diagnostic testing, biological and medical research, analytical chemistry, Q.C., biotechnology, pharmaceutical industries, food, fine chemical, petrochemical, cosmetic, photographic laboratories and the electronics industries.

### FILTRATION

A wide range of filters is available, from activated charcoal adsorbing filters to chemical adsorbing filters for specific applications such as the use of formalin, glutaraldehyde or radioactive iodine labelled compounds and for others applications.

The filters (for "M" series) have a built in microchip device for their manage control.

The CHEMFREE 2000 60 unit incorporates a carbon filter which weighs approximately 13÷21,5 Kg., the CHEMFREE 2000 90 unit incorporates two carbon filters with a total weight of approximately 18÷28,8 Kg. and the CHEMFREE 2000 120 unit incorporates two carbon filters with a total weight of about 26÷43 Kg.

Each fume cupboard is equipped with disposable type prefilters, with an efficiency of 75%÷85% dust weight arrestance (ASHRAE) to protect the main activated charcoal filter.

### DESIGN FEATURES

Each CHEMFREE 2000 cupboard contains an IP54 centrifugal motorfan, capable of maintaining a constant airflow by compensating for the clogging of the prefilters, which occurs during normal operation.

The CHEMFREE 2000 "S" series is equipped with a manual device for adjusting the air velocity to obtain the appropriate air velocity for each specific contaminant used.

The CHEMFREE 2000 "M" series is equipped with a microprocessor based monitoring system.

Each unit has a liquid crystal display to show the face speed and a digital setting system to select the most suitable velocity for each specific contaminant used.

### TECHNICAL SPECIFICATIONS

CHEMFREE 2000 "S" is designed to meet all the routine safety requirements encountered by both the operator and the environment through the use of chemicals reagents.

Units are equipped with a manual device to set the inlet air velocity when heavy or volatile chemicals are used and are supplied with fluorescent lighting.



### CHEMFREE 2000 "M"

- **Microprocessor controlled monitoring system**
- **Highly effective protection from toxic vapours**
- **High filtration efficiency**
- **Large adsorption capacity**
- **Filter monitoring system**
- **Ductless**

Gas/vacuum taps, power points and gas detectors for monitoring filter efficiency are supplied as options.

CHEMFREE 2000 "M" is designed with a microprocessor controlled system for a range of data which includes type and code number of the filter being used, installation date, maximum time allowance for filter use and a warning date for its replacement. Built in with five different languages like italian, english, german, french and spanish. Audible and visual alarms are also available to protect the operator.

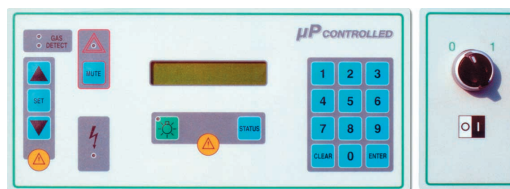
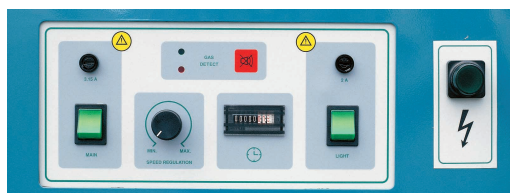
These alarms cover out of range minimum and maximum air velocity, filter saturation, prefilter clogging, anemometer failure, gas detector failure and motorfan malfunctioning.

CHEMFREE 2000 "M" is equipped with fluorescent lighting as well as optional gas/vacuum tap and power point.

### BUILT IN SAFETY

All electronic components, switches, lighting and motorfan have been selected and installed fully isolated from air contaminated with solvents and therefore meet the most stringent safety requirements such as EN 61010/1.

Current directives of the European Community are also covered as certified by the CE mark.



### CONTROL PANELS

- **CHEMFREE 2000 "S"**
- **CHEMFREE 2000 "M"**



### TECHNICAL SPECIFICATIONS

	CHEMFREE 60			CHEMFREE 90			CHEMFREE 120			
<b>AIRFLOW</b>										
Vol/air treated	m <sup>3</sup> /hr	300		400		600				
Average face speed	m/sec	>0,6		>0,6		>0,6				
<b>ELECTRICAL</b>										
Voltage/power		220-240V/50-60Hz/220W		220-240V/50-60Hz/350W		220-240V/50-60Hz/400W				
Lighting		1 x 15 Watts		1 x 18 Watts		1 x 30 Watts				
<b>CONTROLS</b>										
Version "S"		<ul style="list-style-type: none"> <li>• Power on/off • Light on/off • Variable speed air regulation</li> <li>• Hour-counter • Stand-by green light</li> </ul>								
Version "M"		<ul style="list-style-type: none"> <li>• Power on/off • Light on/off</li> <li>• Microprocessor monitoring system checking airflow, pre-filter and filter efficiency • Variable speed air regulation • Audible and visual alarms alert the operator to low/high airflow, fan failure, filter and pre-filter condition, black-out, gas detector and anemometer failure.</li> </ul>								
<b>CONSTRUCTION</b>										
Head section		Epoxy coated zinc plated steel			Epoxy coated zinc plated steel			Epoxy coated zinc plated steel		
Base section		Anodized aluminium			Anodized aluminium			Anodized aluminium		
Spill tray		Acid and solvents resistant material			Acid and solvents resistant material			Acid and solvents resistant material		
<b>FAN MOTOR</b>										
		Centrifugal IP54			Centrifugal IP54			Centrifugal IP54		
<b>FILTER</b>										
Pre-filter (particulate)		1			2			2		
Main filter (charcoal)		1			2			2		
Total weight of A/C filter		See the filter table			See the filter table			See the filter table		
Total weight of chemisorption filter (depending on type)		See the filter table			See the filter table			See the filter table		
<b>DIMENSIONS (mm)</b>										
Useful dimensions		D	W	H	D	W	H	D	W	H
Overall dimensions		603	533	655	603	823	655	603	1123	655
Exhaust duct (diam.)		200			200			200		
Working aperture		200			200			200		
Max front aperture		455			455			455		
<b>WEIGHT kg. (approx.)</b>										
w/o filter		60			70			80		

## ACTIVATED CHARCOAL FILTERS

The filters used in the fume cupboards are manufactured from high grade coconut shell charcoal.

All types of activated charcoal used in these filters are of amorphous structure obtained from the heat controlled oxidation of coconutshells.

The cellulose structure of the coconuts provides the highest adsorption efficiency through a large surface area of up to 1050 m<sup>2</sup>/g.

### FILTER TYPES

#### a) PRE-FILTERS

High performance pre-filters are designed to remove particulates from the air stream.

The filter material is based on electrets, which are permanently charged di-electrics.

They remove particulates from polluted air by strong electrostatic forces generated by the fibres from which they are made.

The combination of strong electric charges and open structure provides a filter with high efficiency, low airflow resistance and high loading capacity.

Pre-filter efficiency is equal to 75-85% dust weight arrestance (ASHRAE).

#### b) MAIN FILTERS

Eight types of filter media are available.

Most of these are impregnated activated carbon, to provide a higher filter capacity for lower molecular weight organic compounds and inorganic gases and vapours.

A number of filter efficiency studies have been carried out, and all results using single bed filters show efficiencies very close to 100%.

#### 1. A/C FILTER

The A/C filter is the most widely used filter in the range, and is used primarily for solvent fume removal.

It is manufactured from coconut-shell based activated carbon of 4 x 8 USS mesh size and surface area up to 1050 m<sup>2</sup>/gm.

Filtration is achieved by the physical adsorption of molecules in the pores of the activated carbon by Van der Waals forces.

**Primary use:** organic odours, hydrocarbons, aromatic solvents, animal odours, excrements, urines, acid odours, cadaverine, putrescine

**Secondary use:** oxygenated nitrogen compounds

#### 2. ACR FILTER

This filter is impregnated with halide salts and is used for the high efficiency removal of iodine and methyl iodine.

It is frequently used for iodination reactions with low-level radioactive iodine and efficiencies in excess of 99,99% have been measured.

**Primary use:** radioactive iodine

**Secondary use:** hydrocarbons

#### 3. FORM FILTER

This filter is impregnated with an oxidizing agent to oxidise formaldehyde to formate salts.

It is widely used in hospital pathology and cytology laboratories.

**Primary use:** formaldehyde

**Secondary use:** organic emissions, hydrocarbons, aromatic solvents, acid gases

#### 4. SULF FILTER

**Primary use:** acid odours, putrescine, cadaverine, acid gases, hydrogen sulphide, methyl mercaptan, sulphur compounds, sulphur dioxide, R.H.>85%

#### 5. UR FILTER

**Primary use:** acid odours, putrescine, cadaverine, acid gases, hydrogen sulphide, methyl mercaptan, sulphur compounds, sulphur dioxide, nitrogen oxygenated compounds

**Secondary use:** organic emissions, hydrocarbons, aromatic solvents, hydrocyanic acid, R.H. <85%

#### 6. CYAN FILTER

**Primary use:** hydrocyanic acid

**Secondary use:** organic emissions, hydrocarbons, aromatic solvents

#### 7. MER FILTER

**Primary use:** mercury vapours

**Secondary use:** organic emissions, hydrocarbons

#### 8. AM FILTER

**Primary use:** ammonia and its derivatives

**Secondary use:** organic emissions, hydrocarbons, aromatic solvents, alkaline odours, excrement, urines animal odours

ADSORPTION INDEX TABLE

Adsorption index table of standard activated charcoal filters (A/C) as to various chemicals  
 The "adsorption Index" is expressed as percentage of weight of adsorbed contaminant/ weight of charcoal in the filter bed.  
 In particular:

- A) Compounds against which the activated charcoals show a high filtration capacity (from 20% to 50%, mean value equal to 35%)
- B) Compound against which the activated charcoals show a good filtration capacity (from 10% to 25%, mean value equal to 16%)
- C) Compounds against which the activated charcoals have a poor filtration capacity (less than 5% but anyway suitable for some applications)
- D) Compounds practically not adsorbed by activated charcoals under standard conditions

ALIPHATIC HYDROCARBONS	A. Methyl Cyclohexanol B. Methanol (Methyl) A. Propyl	HALOGENS	SULPHUR COMPOUNDS
D. Acetylene C. Butane C. Butene D. Butadiene A. Cyclohexane A. n-Decane D. Ethane D. Ethylene A. n-Heptane A. Heptylene B. Hexane B. Isoprene D. Methane A. Metyl Cyclohexane A. n-Nonane A. n-Octane B. Pentane C. Propane C. Propene	<b>ESTERS</b>  A. Amyl Acetate A. Butyl Acetate A. Cellosolve Acetate A. Ethyl Acetate B. Ethyl Formate A. Isopropyl Acetate B. Methyl Acetate A. Methyl Cellosolve Acetate  B. Methyl Formate A. Propyl Acetate	A. Bromine A. Butyl Chloride A. Carbon Tetrachloride  B. Chlorine A. Chlorobenzene A. Chlorobutadiene A. Chloroform A. Chloro Nitropropane A. Choro Picrin A. Dibromoethane A. Dichlorobenzene B. Dichlorodifluoro Methane  A. Dichlorethane A. Dichloroethylene A. Dichloroethyl ether B. Dichloromonofluoro Methane  A. Dichloronitro-Methane A. Dichloropropane B. Dichlorotetrafluoro Ethane  B. Ethyl Bromide B. Ethyl Chloride B. Fluorotrichloromethane B. Freon A. Glycol mono-chlorohydrin  C. Hydrogen Bromide C. Hydrogen Chloride B. Hydrogen Cyanide C. Hydrogen Fluoride B. Hydrogen Iodide A. Iodine A. Iodoform B. Methylen Bromide B. Methyl Chloride A. Methyl Chloroform A. Methylene Chloride A. Monochlorobenzene B. Monofluorotrichloro Methane  A. Perchloroethylene B. Phosgene A. Propyl Chloride A. Tetrachloro Ethane A. Tetrachloro Ethylene A. Trichloro Ethylene B. Vinyl Chloride	B. Carbon Disulphide A. Dimethyl Sulphate A. Ethyl Mercaptan B. Hydrogen Sulphide A. Mercaptans A. Methyl Mercaptan A. Propyl Mercaptan A. Sulphur Compounds B. Sulphur Trioxide A. A. Sulphuric Acid C. Sulphuric Gas
<b>AROMATIC HYDROCARBONS</b>	<b>ALDEHYDES &amp; KETONES</b>  B. Acetone C. Acetaldehyde B. Acrolein A. Crotonaldehyde A. Cyclohexanone A. Diethyl Ketone A. Dipropyl Ketone C. Formaldehyde A. Mesityl Oxide A. Methyl Butylketone A. Methyl Cyclohexanone A. Methyl Isobutylketone A. Pentanone B. Propionaldehyde		<b>NITROGEN COMPOUNDS</b>  A. Acrylonitrile C. Ammonia C. Amines A. Aniline B. Diethyl Amine B. Ethyl Amine A. Indole A. Methyl Acrylate A. Nicotine B. Nitric Acid Fumes A. Nitrobenzene A. Nitroethane C. Nitrogen Dioxide D. Nitrogen Peroxide A. Nitromethane A. Nitropropane A. Nitrotoluene
<b>ACIDS</b>			<b>MISCELLANEOUS</b>  A. Cresol A. Camphor D. Carbon Monoxide A. Ethyl Silicate A. Gasoline D. Hydrogen A. Kerosene A. Menthol A. Ozone A. Nicotine B. Solvents B. Toxic gas A. Turpentine
<b>ALCOHOLS</b>	<b>ETHERS</b>  A. Amyl A. Butyl A. Cellosolve A. Dioxan B. Ethyl B. Ethilene Oxide A. Isopropyl A. Methyl Cellosolve B. Methyl C. Propyl		

### ORDERING INFORMATION

#### FUME CUPBOARDS

CODE	DESCRIPTION
F87 500700	CHEMFREE 2000 60-S
F87 500710	CHEMFREE 2000 90-S
F87 500720	CHEMFREE 2000 120-S
F87 500800	CHEMFREE 2000 60-M
F87 500810	CHEMFREE 2000 90-M
F87 500820	CHEMFREE 2000 120-M

#### FILTERS

CODE	DESCRIPTION	
F87 600700	A/C Filter CHM2000 90-S (general use)	Kg. 9
F87 600705	A/C Filter CHM2000 90-M (general use)	Kg. 9
F87 600710	FOR Filter for CHM2000 90-S (formaldehyde)	Kg. 11.5
F87 600715	FOR Filter for CHM2000 90-M (formaldehyde)	Kg. 11.5
F87 600720	ACR Filter for CHM2000 90-S (radioactive iodine)	Kg. 10.5
F87 600725	ACR Filter for CHM2000 90-M (radioactive iodine)	Kg. 10.5
F87 600730	AM Filter for CHM2000 90-S (ammonia)	Kg. 14.4
F87 600735	AM Filter for CHM2000 90-M (ammonia)	Kg. 14.4
F87 600740	CYAN Filter for CHM2000 90-S (cyanide)	Kg. 10
F87 600745	CYAN Filter for CHM2000 90-M (cyanide)	Kg. 10
F87 600750	MER Filter for CHM2000 90-S (mercury)	Kg. 10
F87 600755	MER Filter for CHM2000 90-M (mercury)	Kg. 10
F87 600760	UR Filter for CHM2000 90-S (urine)	Kg. 10
F87 600765	UR Filter for CHM2000 90-M (urine)	Kg. 10
F87 600770	SULF Filter for CHM2000 90-S (sulphur compounds)	Kg. 10
F87 600775	SULF Filter for CHM2000 90-M (sulphur compounds)	Kg. 10
F87 600800	A/C Filter CHM2000 60/120-S (general use)	Kg. 13
F87 600805	A/C Filter CHM2000 60/120-M (general use)	Kg. 13
F87 600810	FOR Filter for CHM2000 60/120-S (formaldehyde)	Kg. 18
F87 600815	FOR Filter for CHM2000 60/120-M (formaldehyde)	Kg. 18
F87 600820	ACR Filter for CHM2000 60/120-S (radioactive iodine)	Kg. 16
F87 600825	ACR Filter for CHM2000 60/120-M (radioactive iodine)	Kg. 16
F87 600830	AM Filter for CHM2000 60/120-S (ammonia)	Kg. 21.5
F87 600835	AM Filter for CHM2000 60/120-M (ammonia)	Kg. 21.5
F87 600840	CYAN Filter for CHM2000 60/120-S (cyanide)	Kg. 15.5
F87 600845	CYAN Filter for CHM2000 60/120-M (cyanide)	Kg. 15.5
F87 600850	MER Filter for CHM2000 60/120-S (mercury)	Kg. 15.5
F87 600855	MER Filter for CHM2000 60/120-M (mercury)	Kg. 15.5
F87 600860	UR Filter for CHM2000 60/120-S (urine)	Kg. 15.5
F87 600865	UR Filter for CHM2000 60/120-M (urine)	Kg. 15.5
F87 600870	SULF Filter for CHM2000 60/120-S (sulphur compounds)	Kg. 15.5
F87 600875	SULF Filter for CHM2000 60/120-M (sulphur compounds)	Kg. 15.5
F87 600500	Pre-filter for CHM2000 60/120 (pack of 10 pcs.)	
F87 600510	Pre-filter for CHM2000 90 (pack of 10 pcs.)	

Note: CHEMFREE 2000 60 is fitted with no.1 suitable filter  
CHEMFREE 2000 90 and 120 are fitted with no.2 suitable filter

## ACCESSORIES AND OPTIONS

CODE	DESCRIPTION
F87 704300	Stand for CHEMFREE 2000 60
F87 704305	Stand for CHEMFREE 2000 90
F87 704310	Stand for CHEMFREE 2000 120
F87 704285	Mobile trolley for CHEMFREE 2000 60
F87 704290	Mobile trolley for CHEMFREE 2000 90
F87 704295	Mobile trolley for CHEMFREE 2000 120
F87 709080	Power point for CHEMFREE 2000
F87 709085	Gas/vacuum manual tap for CHEMFREE 2000
F87 709078	Filter saturation monitoring system for CHEMFREE 2000 60/90/120-S
F87 500900	Exhaust case for CHM2000 60-S/M
F87 500910	Exhaust case for CHM2000 90-S/M
F87 500920	Exhaust case for CHM2000 120-S/M
F87 600600	A/C exhaust filter 450x300x30 mm.
F87 600610	FOR exhaust filter 450x300x30 mm.
F87 600620	ACR exhaust filter 450x300x30 mm.
F87 600630	AM exhaust filter 450x300x30 mm.
F87 600640	CYAN exhaust filter 450x300x30 mm.
F87 600650	MER exhaust filter 450x300x30 mm.
F87 600660	UR exhaust filter 450x300x30 mm.
F87 600670	SULF exhaust filter 450x300x30 mm.

Distributed & Serviced by:



Commercial Office  
 Via Merendi, 22  
 20010 Cornaredo (MI) - Italy  
 Ph.: ++39 02.93991.92 - Fax: ++39 02.93991.608  
 E-mail: [info@faster.dgroup.it](mailto:info@faster.dgroup.it)  
<http://www.faster-air.com>  
 a D<sup>2</sup>GROUP company

