



SPECTRUM



HIGH END  
FILTRATION PRODUCTS

## **Spectrum Filtration**

**Pvt Ltd** is a

multi-product,

multi-location

company specializing

in the field of high

technology filtration

products and services.

The company has been

set up in collaboration

with Filtrair b.v.,

Netherlands, in order

to be able to offer

international technology

at affordable prices right

here in India. The

company offers a range

of products and

services which are

without peer in the

industry.

## **CRITICALITY OF FILTRATION TO INDUSTRY**

In view of the increasing importance of filtration technology to industrial processes in various segments, Spectrum offers a large range of high efficiency filtration products, without compromising the important features of high dust holding capacity, low pressure drops, ease of installation and maintenance, and energy conservation.

## **SPECIFICATIONS**

This catalog covers products and services covered by the HEPA/ULPA filter range, i.e. efficiencies ranging from H10 to U16 as per EN 1822, (i.e. 65% to 99.99995% under DOP challenge), and also covers various types of filters according to criticality of end use, as per IES-RP-CC001.3.

## **FACILITIES**

Our manufacturing facility for high end filter includes mechanized media pleating, mechanized separator manufacture, mechanized adhesive mixing and dispensing, and final assembly by highly skilled technicians.

Test facilities include the only high capacity Hot DOP monodisperse aerosol generator in India, laser particle counters, a Q 107 test rig, laser scattering face scanners, vibration test, pack tightness testing equipment, fire retardance test equipment, 100% RH testing equipment, and comprehensive microscopic defect analysis equipment. The testing laboratory also includes an ASHRAE 52.2 state of the art test rig, and our laboratory is unmatched anywhere in the country.

## **SERVICES**

Spectrum offers comprehensive back-up services for its products, which include, but are not restricted to, on-site validation services like class level analysis, penetration analysis, and air flow pattern analysis. Additionally, on-site maintenance, documentation and GMP compliance services are offered, and include assistance to the client in developing and sustaining protocols to comply with international FDA requirements.

## **TFM (TOTAL FILTER MANAGEMENT) SERVICES**

Spectrum's TFM services, which relieve the client entirely from all tasks relating to the filtration system. Under this service, Spectrum provides a comprehensive warranty for the air quality, rather than the product itself, even when this necessitates continuous on-site system management.

## **END USES**

End uses for these products and services include Pharmaceutical, Biotechnology, Semi-conductor, Food processing, Nuclear power, research, Hospitals and Medical care centers, Hostile environments (nuclear, biological, and chemical), Film and Digital recording device manufacture, Sterile areas, Bio-hazard areas, and many more.

## TEST STANDARDS AND SPECIFICATIONS

### HEPA and ULPA Filters

Traditionally, manufacturers have been reporting the efficiency, rated flow capacity and initial pressure drop. The test method is usually not specified, or loosely specified.

Spectrum implements and follows test norms and filter construction norms as laid down in IES-RP-34.1 (HEPA and ULPA filter leak tests), and test norms as laid down in EN 1822 and IES-RP-CC001.3 (HEPA and ULPA filters).

These standards specify efficiency testing using thermally generated DOP aerosol challenge, and also classify filters for criticality of application in terms of Type A (suitable for non-critical applications), to Type F (ULPA filters for critical applications). Test methods, on-site validation methods, leakage definitions, and methods of testing are clearly laid down, and followed rigorously by Spectrum. Construction norms with regard to materials of frame and separators, sealant, pack tightness, resistance to rough handling, fire retardance, etc., are also followed by Spectrum.

The combination of the above, coupled with meticulous attention to detail and good workmanship practices ensure that Spectrum HEPA and ULPA filters consistently outperform competing brands, thereby bringing savings to the user.

**Type A :** Minimum efficiency of 99.97% on 0.3  $\mu\text{m}$  at rated flow. Efficiency tested using Hot DOP.

**Type B :** Minimum efficiency of 99.97% on 0.3  $\mu\text{m}$  at 100% and 20% of rated flow. Efficiency tested using Hot DOP.

**Type C :** Minimum efficiency of 99.99% on 0.3  $\mu\text{m}$  and scan tested with Hot DOP challenge for spot penetration using face scanner.

**Type D :** Minimum efficiency of 99.999% on 0.3  $\mu\text{m}$  and scan tested with Hot DOP challenge for spot penetration using face scanner.

**Type E :** Constructed and tested in accordance with MIL-F-51477 or MIL-F-51068.

**Type F :** Minimum efficiency of 99.999% on 0.1 to 0.2  $\mu\text{m}$  and scan tested with Hot DOP challenge for spot penetration using face scanner.



### Prefilters and Intermediate Efficiency Filters

Testing and certification for this range of filters has been sadly lacking in our country. For many years, and right up to the present time, efficiencies for this range of filters are reported in terms of BS 2831, which is an obsolete standard.

Current international norms call for reporting of filters to be tested and evaluated in terms of ASHRAE 52.2, which specifies the rating of filters in terms of MERV (Minimum Efficiency Reporting Value). For the first time, filters are rated in terms of their efficiencies at a particular particle size, rather than in terms of simple gravimetric retention or dust spot efficiency.

Spectrum is a pioneer in the installation of a test rig for the testing of filters in accordance with ASHRAE 52.2, and possesses a state-of-the-art facility for testing, evaluation and reporting of prefilters and intermediate efficiency filters.

Spectrum also supplies prefilters and intermediate efficiency filters for various industrial applications, with media from Filtrair b.v., Netherlands, which is UL certified and certified for efficiency. Domestically available media are not certified, and their actual performance is therefore indeterminate. The Company thereby ensures that its products invariably satisfy client requirements with regard to filtration efficiency and dust holding capacity.

# DEEP PLEAT HEPA AND ULPA FILTERS

Spectrum manufactures a wide range of deep-pleat HEPA filters, unmatched in the industry. Details of the available variants are given below.

Material Options (for Frame) : Stainless Steel, Aluminum (painted, anodized or powder coated), GI, Ply

Material Options (for Separators) : Hardened Aluminium Foil, Corrugated Paper

|  |     |  |
|--|-----|--|
| Efficiency Ranges offered as per EN 1822 | H10 | 93% DOP efficiency                     |
|  | H11 | (Hospital grade, 98% DOP efficiency)   |
|  | H12 | (HEPA, 99.97 % eff. to 0.3 microns)    |
|  | H13 | (HEPA, 99.997% eff. to 0.3 microns)    |
|  | H14 | (HEPA, 99.999% eff. to 0.3 microns)    |
|  | U15 | (ULPA, 99.9995% eff. to 0.12 microns)  |
|  | U16 | (ULPA, 99.99995% eff. to 0.12 microns) |

All filters in ranges H 10 onwards are offered in all the classifications stipulated by IES-RP-CC001.3, regarding criticality of application, and stringency of testing, viz.

**Type A :** Minimum efficiency of 99.97% on 0.3 µm at rated flow. Efficiency tested using Hot DOP.

**Type B :** Minimum efficiency of 99.97% on 0.3 µm at 100% and 20% of rated flow. Efficiency tested using Hot DOP.

**Type C :** Minimum efficiency of 99.99% on 0.3 µm and scan tested with Hot DOP challenge for spot penetration using face scanner.

All the above variants are offered in the following standard sizes and flow ratings. Special sizes are available on request.

| Nominal Size<br>(mm) | Rated Flow at 250 Pa IPD (CMH) |          |         |            |
|----------------------|--------------------------------|----------|---------|------------|
|                      | Lite                           | Standard | Hi Flow | Super Flow |
| 305 x 305 x 150      | 285                            | 340      | 510     | 680        |
| 305 x 610 x 150      | 425                            | 510      | 765     | 1020       |
| 610 x 610 x 150      | 850                            | 1020     | 1530    | 2040       |
| 610 x 762 x 150      | 1065                           | 1275     | 1910    | 2550       |
| 610 x 610 x 305      | 1560                           | 1870     | 2800    | 3740       |
| 610 x 915 x 150      | 1275                           | 1530     | 2300    | 3060       |
| 610 x 1220 x 150     | 1700                           | 2040     | 3060    | 4080       |
| 610 x 1830 x 150     | 2550                           | 3060     | 4590    | 6120       |

All models can be offered in normal duty, high temperature duty, and QPA approved (Nuclear) ratings.



# MINI PLEAT HEPA & ULPA FILTERS

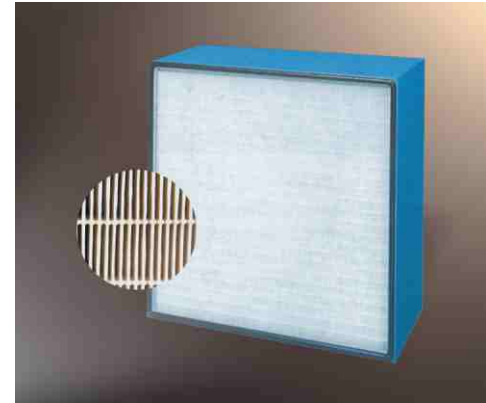
'Spectra mini-pleat' HEPA and ULPA filters are made with state-of-the-art technology, and manufactured to rigid international specifications in the ranges H10 to U16 as per EN 1822.

Multiple choices for frame material are offered viz., aluminum, stainless steel and galvanized steel.

Hot melt adhesive separator as well as ribbon type separatorless filters are offered.

The highest quality borosilicate glass media is used. Filters are tested in Type 'A', 'B' and 'C' categories as per IES-RP-CC001.3.

'Spectra mini-pleat' filters offer substantial advantages over conventional deep pleat filters, not the least of which are higher flow capacities, increased compactness, reduced resistance to flow, and greatly enhanced dust holding capacities.



| Model Identification              | Size (mm)<br>H X W | Flow Cap. (CMH)<br>@ 0.95 m/s, N = Normal | Flow Cap. (CMH)<br>@ 1.5 m/s, H = High |
|-----------------------------------|--------------------|---|--|
| SFMP(1)*-88 (4)* (5)* (6)* (7)*   | 203 x 203          | 110                                       | 200                                    |
| SFMP(1)*-1212 (4)* (5)* (6)* (7)* | 305 x 305          | 260                                       | 465                                    |
| SFMP(1)*-1224 (4)* (5)* (6)* (7)* | 305 x 610          | 535                                       | 958                                    |
| SFMP(1)*-1824 (4)* (5)* (6)* (7)* | 457 x 610          | 830                                       | 1486                                   |
| SFMP(1)*-2424 (4)* (5)* (6)* (7)* | 610 x 610          | 1140                                      | 2042                                   |
| SFMP(1)*-2430 (4)* (5)* (6)* (7)* | 610 x 762          | 1450                                      | 2597                                   |
| SFMP(1)*-2436 (4)* (5)* (6)* (7)* | 610 x 915          | 1750                                      | 3134                                   |
| SFMP(1)*-2448 (4)* (5)* (6)* (7)* | 610 x 1219         | 2310                                      | 4137                                   |
| SFMP(1)*-2472 (4)* (5)* (6)* (7)* | 610 x 1828         | 3490                                      | 6250                                   |

The initial resistance for HEPA filters is less than 250 Pa at given flow rates.  
The initial resistance for ULPA filters is less than 310 Pa at given flow rates.

| (1)*<br>Pleat Height | (2)*<br>Frame Height | (3)*<br>Frame Width | (4)*<br>Frame Depth | (5)*<br>Efficiency | (6)*<br>Frame Material | (7)*<br>Gasket Location |
|----------------------|----------------------|---------------------|---------------------|--------------------|------------------------|-------------------------|
| N : Normal (65 mm)   | 8 : 203 mm           | 8 : 203 mm          | 2 : 66 mm           | 10 : 95%           | A : Aluminium          | N : None                |
| H : High (130 mm)    | 12 : 305 mm          | 12 : 305 mm         | 3 : 70 mm           | 11 : 98%           | S : Stainless Steel    | D : Downstream          |
|                      | 18 : 457 mm          | 24 : 610 mm         | 4 : 100 mm          | 12 : 99.99%        | G : Galvanised Steel   | U : Upstream            |
|                      | 24 : 610 mm          | 30 : 762 mm         | 6 : 149 mm          | 13 : 99.997%       |                        | S : Both Sides          |
|                      |                      | 36 : 915 mm         | 12 : 292 mm         | 14 : 99.999%       |                        |                         |
|                      |                      | 48 : 1219 mm        |                     | 15 : 99.9995%      |                        |                         |
|                      | 72 : 1828 mm         |                     | 16 : 99.99995%      |                    |                        |                         |

Example :

Model SFMP-N-2424-3-12-AD refers to pleat height 65 mm (1140 m<sup>3</sup>/hr @ 250 pa), frame height 610 mm, width 610 mm, depth 70 mm, efficiency 99.99 %, frame material aluminum, gasket down stream.

# SPECIALITY APPLICATION FILTERS

## Opti-pleat Filters



Filtrair's "Opti-pleat" filters represent the latest advancement in pleated filter technology. The Opti-pleat is the only 300 mm deep pleat without metal separator in the market today. Due to its optimized, wide-open and patented fixed pleating structure, the Opti-pleat pack sports a unique V-supported deep pleat with an unmatched 10 mm wide air entry pleat throat. This results in an excellent combination of pressure drop and dust holding capacity.

The unique construction of the Opti-pleat makes it the ideal choice even under:

High air velocity • Variable air flow • Moisture laden air • High dust load situations

They can be used as terminal filters in applications upto Class 8 as per ISO 14644 (Class 100,000 as per US Federal Standard 209E), or as prefilters to HEPA filters in more stringent applications.

Sizes and models are detailed below. Other sizes are available on request.

Technical Data acc. to EN 779 -Filtrair Opti-pleat Filter. Model OP-95T 1/1

| Model      | Size (mm)       |
|------------|-----------------|
| OP-95T 1/1 | 592 x 592 x 292 |
| OP-95T 5/6 | 490 x 592 x 292 |
| OP-95T 1/2 | 287 x 592 x 292 |

| Performance                                  | Unit        | Value |
|--|-------------|-------|
| Initial resistance @ 3400 m <sup>3</sup> /hr | Pa          | 80    |
| Initial resistance @ 4250 m <sup>3</sup> /hr | Pa          | 105   |
| Final resistance                             | Pa          | 625   |
| Average efficiency                           | %           | 93    |
| Dust holding capacity                        | Grs         | 630   |
| Burst pressure                               | Pa          | 3000  |
| Filter class according to                    | EN 779      | F8    |
| MERV rating according to                     | ASHRAE 52.2 | 14    |

## Hospital Grade Filters

Hospitals and healthcare facilities require clean air facilities, but usually not to the certified clean room levels, except in sensitive Operation theatres. In the absence of any other option, HEPA filters are generally used, which leads to high capital and operating cost in terms of power consumption, filter replacement and servicing cost, etc.

Spectrum offers special hospital grade filters, with efficiency ratings of upto 98% DOP (H11 as per EN 1822) but which match the flow rate of a Hi Flow HEPA filter at just half the initial pressure drop. Dual layer filters are also available, for high dust holding applications. These filters are optimized for service in clean areas which are sub-certifiable and yet require rigid environmental control. They offer a combination of relatively lower initial cost as compared to similar capacity HEPA filters, 50% lower initial pressure drop, which leads to power savings and substantially higher dust holding capacities, which results in fewer change or service cycles.

Sizes and models are detailed below. Other sizes are available on request.

| Size<br>(mm)    | Flow Capacity in CMH at 125 Pa I.P.D. |              |
|-----------------|---------------------------------------|--------------|
|                 | 93% DOP eff.                          | 98% DOP eff. |
| 305 x 305 x 150 | 500                                   | 425          |
| 610 x 610 x 150 | 2000                                  | 1700         |
| 610 x 610 x 305 | 4000                                  | 3400         |



## High Temperature Filters

Spectrum offers a wide range of filter products for use in high temperature applications, ranging in efficiency from G4 as per EN 779 to H13 as per EN 1822.

| Temp Range  | Frame MOC        | Sealant Type              |
|-------------|------------------|---------------------------|
| Upto 175 °C | GI, Aluminum, SS | Epoxy                     |
| Upto 250 °C | GI, Aluminum, SS | RTV Silicon               |
| Upto 750 °C | SS               | Mechanical Seal / Ceramic |



## FAN FILTER MODULE

Spectrum manufactures state-of-the-art fan filter modules incorporating a choice of mini-pleat HEPA filters or conventional deep pleat HEPA filters. Options of top mounted radial fan, or side mounted centrifugal fan are also available in the standard range. Prefilters incorporate UL certified media, to ensure extremely high module service life. Blowers are completely maintenance-free, low noise type. Modules with removable and replaceable HEPA filters are also available in the standard range.



## HIGH PERFORMANCE FILTER HOUSINGS

Quality filter housings are as important as filters to ensure that the filtration systems integrity is protected. Housings should therefore be made to the highest specifications to ensure system integrity.

Spectrum offers a range of standard housings of various designs to suit practically every type of filter and end application. These housings are available in choice of materials, ranging from GI, powder coated MS, anodized or powder coated Aluminum, and Stainless Steel.

Some types are briefly enumerated below :

- 'Spectra Universal' holding frame with extruded aluminum body and spring holding clips eliminates operator error, seal defects, and features quick installation and release. Front mounting type.
- 'Spectra Snap Lock' side insertion and removal housing for HEPA filters featuring CAM locking, bag in-bag out facility, positive mechanical seal, and quick release mechanism.
- 'Spectra Snap Lock' bottom-entry HEPA filter housings suitable for slab installation or false roof installation are offered, incorporating provisions for DOP injection port, and differential pressure sensing port. These housings also feature positive lock mechanisms to eliminate inadvertent operator error while installing filters, and thereby preclude the possibility of leakage.

Spectrum also offers custom-designed holding/mounting arrangements for high performance filter systems.



**'Spectra Universal' Holding Frame**



**'Spectra Snap Lock'**

# FILTRATION AND OT MODULES

Spectrum offers a wide range of clean air filtration modules for wall mounting (pressurizing type) or for ceiling mounting (recirculating type), including specific modules configured for Operation Theater duty, and with



option of built in DX type air conditioning, ultraviolet germicidal, and positive control of temperature, humidity and airborne particle level.

OT modules are specialized filtration modules incorporating additional features for bactericidal effect, as well as special provisions for surgical and general lighting, conduiting for anesthetic gases, and electrical cabling, and other customized features which are essential in a modern Operation Theater. These modules create a sterile

environment in the 'critical' zone, and achieve zero bacteria colony counts in the wound vicinity. They are therefore extremely helpful in eliminating post-operative complications which arise due to infection.

| Model No. | Filter Area (mm)  | Flow Cap. (CMH) | AC (TR)  |
|-----------|-------------------|-----------------|----------|
| HOT 7P    | 610 x 305 -1 No.  | 425             | N.A.     |
| HOT 7PC   | 610 x 305 -1 No.  | 425             | 0.5      |
| HOT 15P   | 610 x 610 -1No.   | 850             | N.A.     |
| HOT 15PC  | 610 x 610 -1Nos.  | 850             | 1.0/1.5* |
| HOT 30P   | 610 x 610 -2 Nos. | 1700            | N.A.     |
| HOT 30PC  | 610 x 610 -2 Nos. | 1700            | 1.5/2.0* |
| HOT 30M   | 610 x 610 -2 Nos. | 1700            | N.A.     |
| HOT 30MC  | 610 x 610 -2 Nos. | 1700            | 1.5/2.0* |
| HOT 45M   | 610 x 610 -3 Nos. | 2550            | N.A.     |
| HOT 45MC  | 610 x 610 -3 Nos. | 2550            | 2.0/3.0* |

\*Selectable depending on AC load

All HEPA filters are 150 mm deep.

- Nomenclature :
- Hot : HEPA based OT module
  - Numeral indicates approx. vol. flow in cu.m. per min.
  - Suffix P indicates the unit is a wall or attic mounted module for pressurizing an area
  - Suffix C indicates the unit incorporates air conditioning (cooling and dehumidification)
  - Suffix M indicates the module is a ceiling mounted type, recirculating air.

OT modules of various sizes can be configured using the above standard modules. HOT modules are therefore extremely useful, particularly for difficult procedures which entail a high risk of post operative infection.

These modules can also be used to do modular clean room projects.

After installation and commissioning, each module is validated for temperature, relative humidity (i.e. surgeon comfort), particle levels, bacteria colony counts, airflow pattern (optional) and noise level.

# VALIDATION SERVICES

Spectrum offers testing and validation services for filtration products which are unparalleled in India.

## Factory Testing

Factory test equipment includes a Q 107 test rig for HEPA filter testing, filter scanning equipment, an ASHRAE 52.2 test rig for prefilters and filters of intermediate efficiency, facilities for qualitative and quantitative analysis of contaminants, mechanical strength test facilities, e.g. rough handling, pack tightness, resistance to hot air, flame, moisture, and vibration.

Spectrum offers comprehensive test facilities for all parameters related to filtration properties as well as physical characteristics of any kind of air filter.

Pre and intermediate range filters upto MERV 16 are tested as per ASHRAE 52.2 (upto F9 as per EN 779), whereas HEPA and ULPA filters are tested and certified in accordance with IES-RP-CC001.3 and EN 1822.

## TFM (Total Filter Management)

Spectrum introduces for the first time in India, the concept of Total Filtration Management. Under this regime, Spectrum undertakes comprehensive supply and maintenance services, wherein the air quality is warranted, and Spectrum maintains the installation in a cost-effective manner, thereby providing the client with major annualized savings in terms of capital and running costs.

This includes :

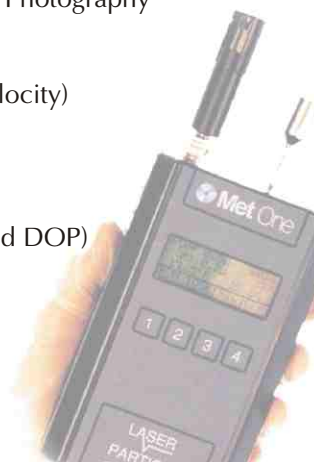
- Selection and supply of optimal performance filters
- Supervision of filtration system installation
- On-site validation of the installation
- On-site supervision of filter performance and air quality
- 'Early bird' reporting of potential problems, to enable prompt corrective action
- Qualitative identification of contamination sources by microscopic analysis.

Laboratory and on-site testing facilities include the following :

- Documentation
- EDX Report
- XRD Report
- Microbial Analysis Bacteriological, Fungal
- Air Quality Monitoring (by RDS machine)
- Airborne Particulate Contamination Monitoring
- On site HEPA Filter Leak Test (by Hot DOP)
- Air Flow Pattern and Strength (by 'Dräger' air flow tester)
- Photography by Polarized Light/Stereozoom
- SEM (Scanning Electron Microscope) Photography
- Physical and Chemical Analysis
- Microbial Flora of Air (by Settling Velocity)
- Particle Size Efficiencies
- Air Velocity Measurement
- On Site HEPA Filter Leak Test (by Cold DOP)
- Air Flow Pattern and Strength (by Titanium Chloride Aerosol test)

## On Site Validation and Testing

Spectrum offers comprehensive on-site validation and certification services for filtration installations. These include, but are not restricted to, leak detection, clean room level measurement and certification, air flow pattern analysis, dead zone identification and elimination, and comprehensive documentation with regard to maintenance and validation procedures.

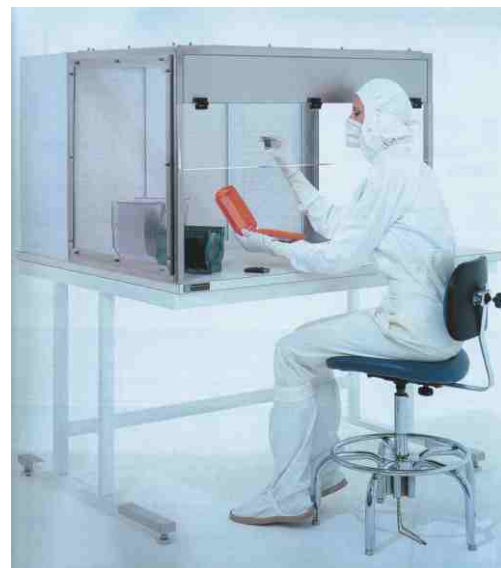


# HORIZONTAL AND VERTICAL FLOW LAMINAR AIR WORKSTATIONS



Spectrum offers state-of-the-art Laminar Air Flow Work Stations in a wide range of sizes, pressure categories, biosafety categories, and choice of construction material.

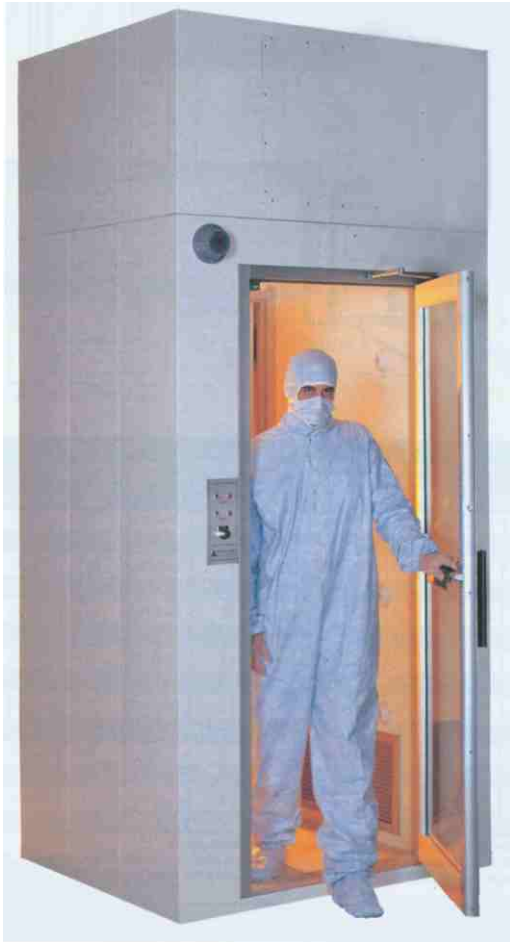
Optional features include digital pressure and velocity sensing, biohazard failure alarm systems, shutter open indicators, testing ports, and many others.



| Model           | Size (mm)  | Type of Unit  | MOC    |
|-----------------|------------|---|--------|
| SFL-HL-01       | 610 x 610  | Horizontal Class 5 (Class 100)                          | CRCA   |
| SFL-HLS-01      | 610 x 610  | Horizontal Class 5 (Class 100)                          | SS 304 |
| SFL-VL-01       | 610 x 610  | Vertical Class 5 (Class 100)                            | CRCA   |
| SFL-VLS-01      | 610 x 610  | Vertical Class 5 (Class 100)                            | SS 304 |
| SFL-HL-02       | 1220 x 610 | Horizontal Class 5 (Class 100)                          | CRCA   |
| SFL-HLS-02      | 1220 x 610 | Horizontal Class 5 (Class 100)                          | SS 304 |
| SFL-VL-02       | 1220 x 610 | Vertical Class 5 (Class 100)                            | CRCA   |
| SFL-VLS-02      | 1220 x 610 | Vertical Class 5 (Class 100)                            | SS 304 |
| SFL-HL-03       | 1830 x 610 | Horizontal Class 5 (Class 100)                          | CRCA   |
| SFL-HLS-03      | 1830 x 610 | Horizontal Class 5 (Class 100)                          | SS 304 |
| SFL-VL-03       | 1830 x 610 | Vertical Class 5 (Class 100)                            | CRCA   |
| SFL-VLS-03      | 1830 x 610 | Vertical Class 5 (Class 100)                            | SS 304 |
| SFL BIO-1-IIA   | 1220 x 610 | Vertical Class 5 (Class 100), Class II-ABiosafety unit  | CRCA   |
| SFL BIO-1-IIA-S | 1220 x 610 | Vertical Class 5 (Class 100), Class II-ABiosafety unit  | SS 304 |
| SFL BIO-2-IIA   | 1220 x 610 | Vertical Class 5 (Class 100), Class II-ABiosafety unit  | CRCA   |
| SFL BIO-2-IIA-S | 1220 x 610 | Vertical Class 5 (Class 100), Class II-ABiosafety unit  | SS 304 |
| SFL Bio-1-IIB   | 1220 x 610 | Vertical Class 5 (Class 100), Class II-B Biosafety unit | CRCA   |
| SFL BIO-1-IIB-S | 1220 x 610 | Vertical Class 5 (Class 100), Class II-B Biosafety unit | SS 304 |
| SFL BIO-2-IIB   | 1830 x 610 | Vertical Class 5 (Class 100), Class II-B Biosafety unit | CRCA   |
| SFL BIO-2-IIB-S | 1830 x 610 | VerticalClass 5 (Class 100), Class II-B Biosafety unit  | SS 304 |

Units are also offered in SS 316. All CRCA units are available powder coated / painted. Class 5 as per ISO 14644 and Class 100 as per Federal Standard 209E.

## AIR SHOWERS



Spectrum offers a wide range of entry control products, of which the air showers are a prime product. Spectrum air showers offer electronically interlocked doors, timer adjustable blower settings, adjustable nozzles for flow and direction, as well as options of proximity sensing actuation, manual override, panic button, floor level aspiration. Models are available in a number of sizes ranging from the smallest single man showers, to tunnels for large personnel and material handling. Choice of material of construction between CRCA powder coated, and SS 304 are offered. All showers are self-contained stand-alone units, which require a minimum of on-site erection, and maintenance. Heavy duty motors and switching, and H13 rated HEPA filters ensure superb performance throughout the life of the air shower.

| Model      | Size (W x L x H)   | No. of Persons |
|------------|--------------------|----------------|
| SFL-AS-01  | 1220 x 1220 x 2000 | 1-2            |
| SFL-AS-02  | 1220 x 1830 x 2000 | 2-4            |
| SFL-AS-03  | 1830 x 1220 x 2000 | 2-4            |
| SFL-AS-04  | 1830 x 1830 x 2000 | 6-8            |
| SFL-AS-02T | 1220 x 2440 x 2000 | Tunnel         |
| SFL-AS-03T | 1830 x 2440 x 2000 | Tunnel         |
| SFL-AS-04T | 1830 x 2440 x 2000 | Tunnel         |

Special sizes on request.

## PASS BOXES

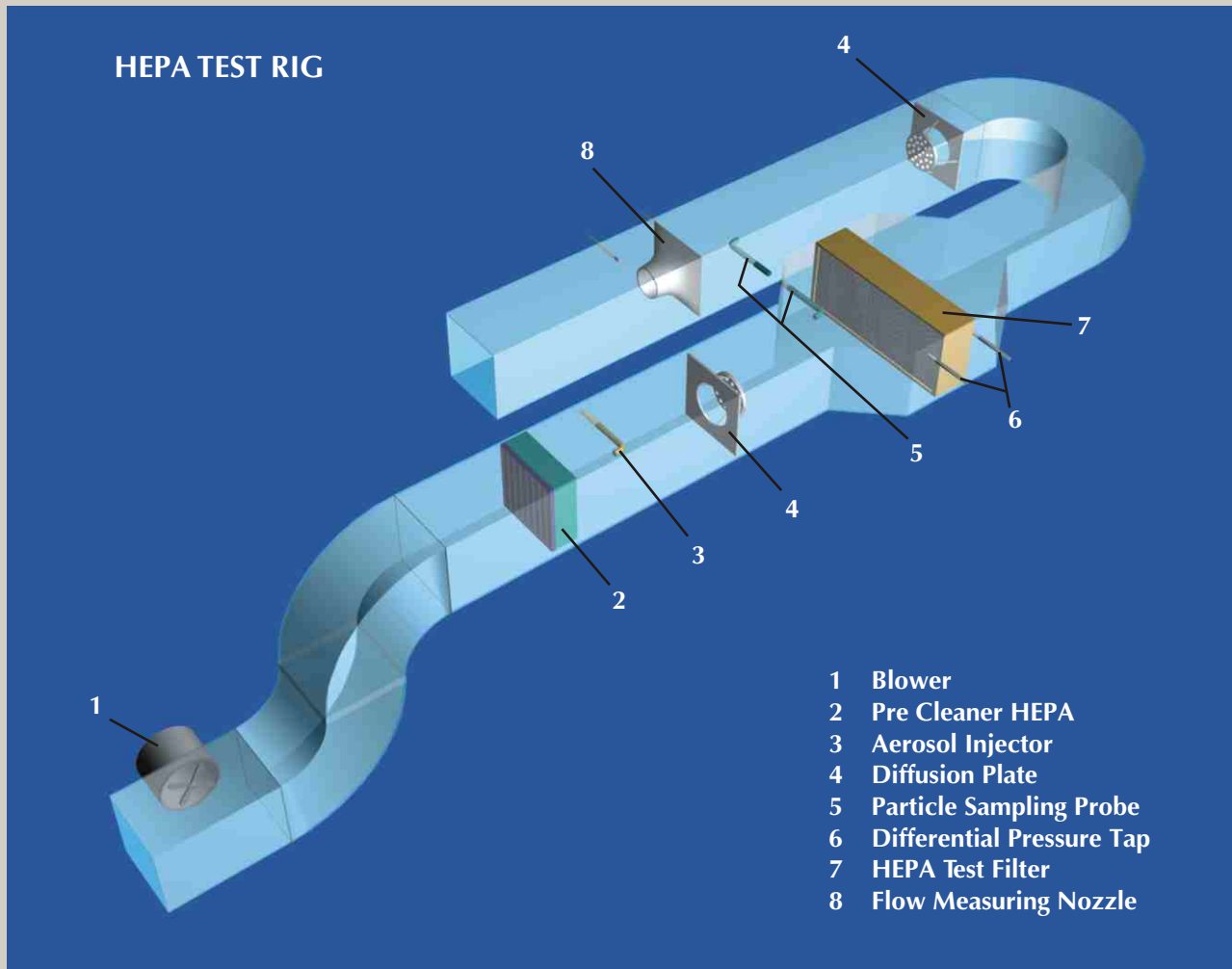
Spectrum manufactures Pass boxes (also known as hatch windows), with double electronically interlocked doors, door actuated lights and UV tubes, smooth interior, glass panels in doors, and complete air tightness to eliminate cross-contamination between clean and non-clean areas.

Standard pass boxes in SS 304 construction are offered in sizes of 305 x 305 x 305 and 610 x 610 x 610 mm. Special sizes are available on request.

Pass boxes are available in plain hatch window option, which offers only cabinet and interlocked doors, or in 'clean air' option, which features a HEPA filter and blower assembly in addition to interlocked doors, and thereby ensures clean conditions at all times within the pass box. Optional extras include a unique exhaust system for venting the pass box prior to door opening.



Spectrum's test rig for high end filtration products is compliant with EN 1822. The all-stainless steel construction, with precleaning HEPA filters, ensures no extraneous contamination or background counts, thus guaranteeing accuracy, consistency, and repeatability of test results. Operation of the rig is fully automatic, actuated by pneumatic and electrical systems. Purge in, purge out system is EN 1822 compliant, and can be carried out from a remote location. A central console provides complete test monitoring and control readouts, and is interfaced with a computer to facilitate data analysis and test reporting.



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