

Filters for Green Buildings



Through the Industrial progression in India, one of the most nagging ailments has been the sullied effect of air contamination in various production processes.

Spectrum Filtration Pvt Ltd is a market leader in providing air filtration solutions in India. Spectrum has rapidly emerged into a pan-Indian multi-product air-filtration company. Apart from offering high quality filtration products, we have developed and perfected a Total Filter Management (TFM) program which has been successfully implemented at several customer sites, and they have benefited from better air quality and reduced operating costs. The distinction that Spectrum brings to the filtration market is its attention to customized solutions across varied industry segments.

At Spectrum we see technology as central to our ethos. Our technical tie-up with 'Filtration Group - Filtrair USA' for the manufacture of high quality intake-air filter ensures that we have access to the latest technology. The Spectrum-FGI-Filtrair linkage brings world class air filtration products and practices to your doorstep.



Filtration Group was established in 1942 with a focused approach exclusively on air filtration products and a clear vision to be global leaders in this sector. Filtration Group acquired Filtrair bv, Netherlands, a leading global manufacturer of air filter media with a lineup of very high quality air filtration products.

With a turnover of over US\$ 140 MN and 10 US and 2 European filter manufacturing facilities, Filtration Group enjoys a dominating presence in over 65 countries across the world.



We are committed to provide speciality filtration products and services, that meet or exceed our customer's expectation of quality and performance - on time, every time.

Application Areas

- ❖ Green Buildings and Hotels
- ❖ Clean Room, Medical Facilities and Hospitals
- ❖ Pharmaceutical and Food Processing Units
- ❖ Manmade Fiber Manufacturing Units
- ❖ Spray Painting Booths
- ❖ Petrochemicals
- ❖ Optical and Electronic Plants
- ❖ Fertilizer Plants
- ❖ Gas Turbine and Compressor Intake
- ❖ Utility and Co-generation Plants



Green Building helps to reduce Green House Effects

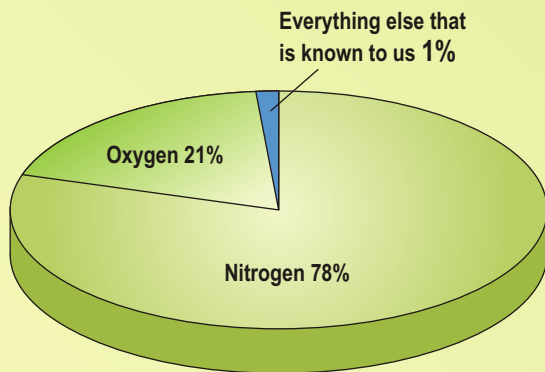
The concept of Green Building has evolved to create environmentally sound buildings and reduce the overall impact on human health.

Green buildings are designed to efficiently use energy, water and other natural resources to create a health conducive indoors and reduce the overall impact on the environment as well as non-renewable natural resources.

How Green Is My Building?

To define **Green Building** and establish a common standard of measurement, the USGBC developed the LEED (Leadership in Energy and Environmental Design) Green Building Rating System®. This system sets well-founded, scientific standards where decisions and changes can be made to positively affect your building's environmental footprint. In addition, LEED promotes whole-building design practices, recognizes environmental leadership in the building industry, stimulates green competition, raises consumer awareness of green building benefits and transforms the building market into a more environmentally responsible entity.

Understanding the Air we Breathe



Air Filtration is based on only 1% of what is in the air.
To understand the air we breathe, we must first break it down -

| | |
|------------------------------|---|
| 1% broken down as | Part 1 1. Rock: Atmospheric impurities, volcanic ash, sea salt, sand or hard products broken down to become air borne. 2. Growth: Pollen, mold and bacteria spores or soft products broken down to become air borne. |
| | Part 2 1. Liquid: Water vapour. 2. Variable gases, carbon dioxide, methane, carbon monoxide, ozone, ammonia, nitrogen oxides and hydrogen sulphides. |
| | Part 3 1. Trace amounts of Argon, Neon, Helium, Krypton, Hydrogen and Xenon - 1%. |

ANSI/ASHRAE Standard 52.2

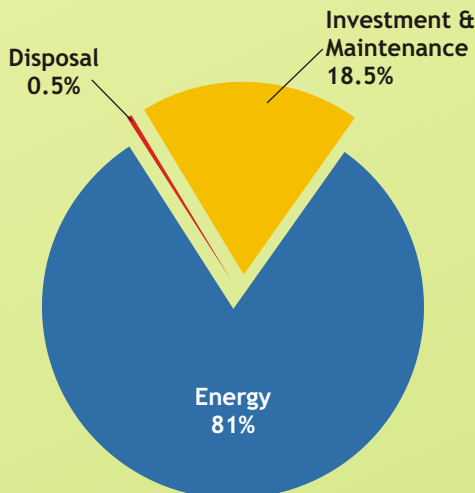
Standard 52.2 is a testing procedure that evaluates the performance of air cleaning devices as they remove specific-diameter particles. Here, standardized dust is fed into the air cleaning device at intervals to simulate the accumulation of particles during the filter's normal service life. The standard describes how to generate the aerosols required for conducting the test and establishes a method for counting airborne particles sized between 0.30µ and 10µ. The count of specific-size particles both upstream and downstream of the test filter determines its efficiency. The standard also prescribes necessary equipment requirements and describes how to report test results. For the hospital engineer, the reporting mechanism is most useful.

| MERV | | | |
|---|---|----------------------|-----------------------|
| Standard 52.2 Minimum Efficiency Reporting Value (MERV) | Composite Average Particle Size Efficiency % in Size Range, µm | | |
| | Range 1 0.30 - 1.0 | Range 2 1.0 - 3.0 | Range 3 3.0 - 10.0 |
| 1 | n/a | n/a | E3 < 20 |
| 2 | n/a | n/a | E3 < 20 |
| 3 | n/a | n/a | E3 < 20 |
| 4 | n/a | n/a | E3 < 20 |
| 5 | n/a | n/a | 20 ≤ E3 < 35 |
| 6 | n/a | n/a | 35 ≤ E3 < 50 |
| 7 | n/a | n/a | 50 ≤ E3 < 70 |
| 8 | n/a | n/a | 70 ≤ E3 |
| 9 | n/a | E2 < 50 | 85 ≤ E3 |
| 10 | n/a | 50 ≤ E2 < 65 | 85 ≤ E3 |
| 11 | n/a | 65 ≤ E2 < 80 | 85 ≤ E3 |
| 12 | n/a | 80 ≤ E2 | 90 ≤ E3 |
| 13 | E1 < 75 | 90 ≤ E2 | 90 ≤ E3 |
| 14 | 75 ≤ E1 ≤ 85 | 90 ≤ E2 | 90 ≤ E3 |
| 15 | 85 ≤ E1 < 95 | 90 ≤ E2 | 90 ≤ E3 |
| 16 | 95 ≤ E1 | 95 ≤ E2 | 95 ≤ E3 |

Pressure Drop Considerations in Air Filtration

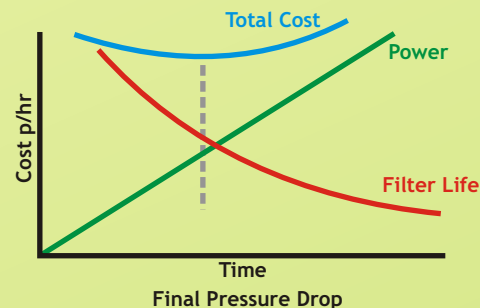
In life cycle costing, filter life is crucial. Extended life can be attained by operating a filter to the highest designed final pressure drop which is acceptable. The longer the filter is in use, the lower will be the filter cost per unit of time. However, running the filter to a high final pressure drop may be more expensive, because the energy costs required to achieve this final pressure drop may nullify all the savings in filter life extension.

Three major components to life cycle costing formula are initial investment and maintenance, energy consumption, and disposal. Based on operating characteristics, we know the cost breakdown. Because energy comprises a major portion of the cost and because pressure drop is the precursor of this energy usage, providing clean air depends most on efficiency and pressure drop.



Source: <http://www.nafahq.org/LibraryFiles/Articles/Article023.htm>

Optimum Final Pressure Drop



The equation used to derive the optimum final pressure drop is:

$$\text{Energy Consumption (kWh)} = Q \Delta P t \eta 1000$$

- Q = Air Flow (m³/sec)
- ΔP = Avg. Pressure Loss
- t = Time in Operation (hrs)
- η = Fan Efficiency

Putting the numbers in this formula, Facility Managers can expect to find lower overall electrical usage/operating costs for those filters that have lower average pressure drops. It can help determine the best time to change-out their filters.

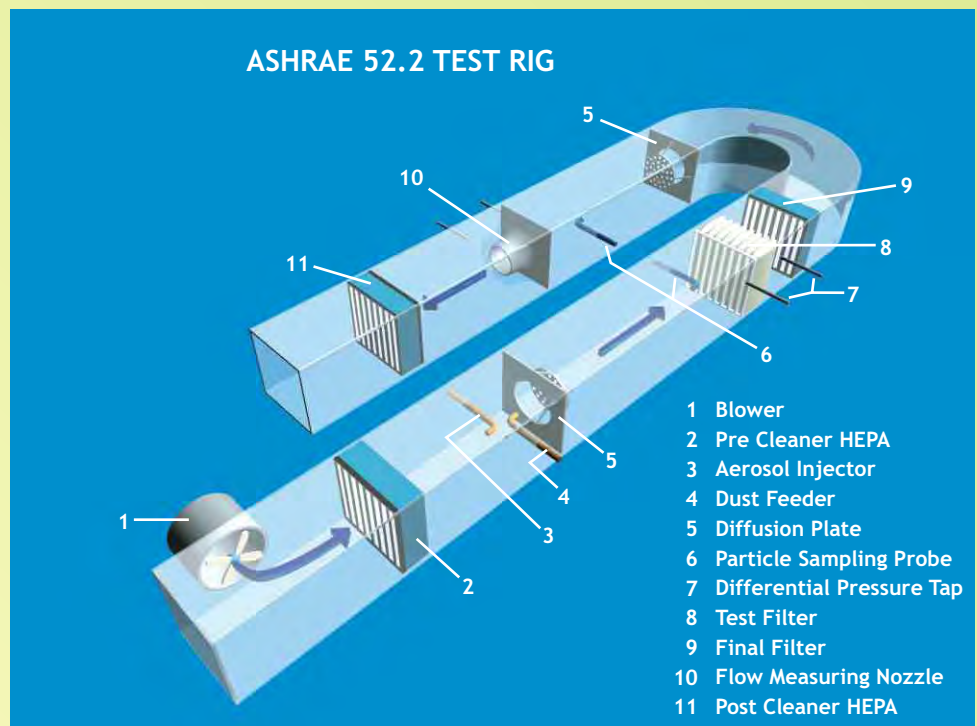
OUR ASHRAE 52.2 TEST FACILITY

The ASHRAE 52.2 - 1999 test method which uses a particle counter and a defined solid aerosol to determine efficiency of a filter is the latest air filter test standard to be published by the "American Society for Heating, Refrigerating and Air-conditioning Engineers" (ASHRAE).

We have set up an ASHRAE 52.2 Test Rig at our new manufacturing and test facility with the objective of answering a very commonly asked question "What is the efficiency of the filter in terms of particle size?"

The old ASHRAE 52.1 test standard measured the efficiency of a filter using a cumbersome dust spot sampler and opacity meter. The efficiency results were based on the air filter's ability to reduce the staining potential of atmospheric dust. The test procedure did not measure "Particle Size efficiency".

To answer this often asked question about "Particle Size Efficiency", we have set up an ASHRAE 52.2 test rig. We acknowledge the immense support received from Mr Erik Kuiper - Director Technical at Filtrair b.v., Netherlands in building this test rig. Mr Kuiper is a member of the ASHRAE committee that wrote this standard.



Spectra MERV 13 and above Green Range



Spectra Cell Compact

Available option: MERV 9 - 15



Description

'Spectra Cell Compact' mini pleated filters offer substantial advantages over conventional deep pleat Ashrae filters, not the least of which are higher flow capacity, less space, reduced resistance to flow, and greatly enhanced dust holding capacity. It serves as an excellent final filter for in air intake systems of combustion engines and as a final filter in HVAC systems.

Advantages

- ❖ Uses special grade micro glass fiber paper spaced with uniformly positioned hot melt adhesive beads to ensure optimum air-flow.
- ❖ Works perfectly under high humidity conditions.
- ❖ Compact design enables system designers to make smaller filter house.
- ❖ Compact design ensures short change time.
- ❖ Can resist high differential pressure drop upto 100 mm WC.
- ❖ Works perfectly even in turbulent, variable air volume and vibration in system.
- ❖ Exceeds LEED/Green requirement of MERV 13.

Spectra Cell V

Available option: MERV 9 - 15



Description

The Spectra Cell V bank filter features a fire retardant, water resistant glass fiber media housed in a sturdy polystyrene frame. The pleats are separated with thermoplastic (hotmelt) separators. A very high ratio of media to filter face area ensures that the filter is capable to handle very high air flow volume at relatively low pressure drop.

Advantages

- ❖ Low replacement and maintenance overheads due to longer filter life.
- ❖ Unaffected by variable air flow in system.
- ❖ May be operated up to 5000 m³/h and in either air flow direction.
- ❖ Mini-pleat 'separator-less' filter.
- ❖ Economic operational cost due to long life and low pressure drop.
- ❖ Lower pressure drop to air flow promotes major energy savings
- ❖ Front or reverse mount installations is possible due to dual direction media
- ❖ High efficiency Microfiber glass medium.
- ❖ Highest dust holding capacity and long filter life.
- ❖ Exceeds LEED/Green requirement of MERV 13.

Spectra MERV 13 and above Green Range



SMF Pocket

Available option: MERV 9 - 15



Description

The Spectra SMF Pocket Filter offers high efficiency filtration while maintaining low resistance to airflow. The non-shed media eliminates fiber migration downstream and the ultrasonic welding provides zero leakage from pocket edges. The open throat design and the precise pocket spacing produces a product that is aerodynamically balanced and provides excellent all-round performance.

Advantages

- ❖ Ultrasonic welding at edges.
- ❖ Open throat design for optimum air flow.
- ❖ Galvanized steel header and J-channels for filter strength UL Class 2.
- ❖ Available in a wide range of sizes.
- ❖ Gasket options available.
- ❖ Pocket support loops are available on request.
- ❖ Exceeds LEED/Green requirement of MERV 13.

Geopleat

Available option: MERV 10 - 14



Description

The Geopleat provides a high level of filtration in a broad variety of applications. A thermal embossing pleating and glue bead media separation technique creates a three-dimensional pleat in the media. This unique pleat design and spacing allows the air stream to smoothly transition into the media and evenly throughout the depth of the media.

Advantages

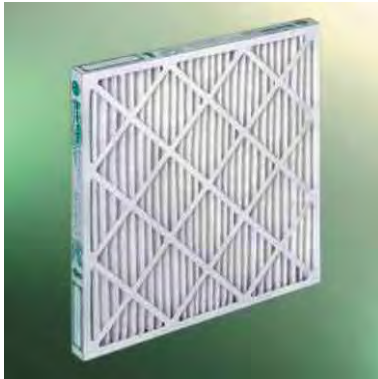
- ❖ Advanced pleat geometry for even dust loading and maximum service life.
- ❖ Patented filter technology.
- ❖ Very low resistance to air-flow results in lower energy costs.
- ❖ Low air flow resistance provides considerable energy savings in most systems.
- ❖ Complete media utilization gives longer filter life.
- ❖ Glue bead pleat separation technique completely adheres to the media and has no sharp edges which eliminates the risk of damage to the filter media during transport, handling and installation.
- ❖ The rigid pleat pack requires no upstream or downstream grids to protect the media from damage.
- ❖ UL Class 2.
- ❖ Sustainable component for a LEED/Green Building initiative.
- ❖ Exceeds LEED/Green requirement of MERV 13.

Spectra MERV 13 and above Green Range



Greenpleat

Available option: MERV 13



AEROSTAR

From FGI

100%
Recycled
Paperboard



Description

The AeroStar®MERV 13 Green Pleat is specifically designed to meet the air filtration efficiency criteria required to gain points toward certification in the Leadership in Energy and Environmental Design (LEEDs) Green Building rating system. Most air filters reaching MERV 13 high efficiency levels require greater depth and retrofitting expense to be installed. The Green Pleat delivers high efficiency in a compact 2" depth design allowing immediate installation with absolutely no modification to existing equipment. Simply replace the existing lower efficiency pleat or disposable air filter with the Green Pleat upgrade the system to the LEEDs required MERV13 level.

The MERV 13 Green Pleat is designed to meet air filtration efficiency standards set forth in the LEED Programs for Existing Buildings and New Construction, as well as an effective IAQ tool for LEED in Schools. The MERV 13 Green Pleat can also be used in industrial and commercial complexes, hospitals and universities or wherever higher efficiency air filtration is desired to remove pollens and allergens.

Advantages

- ❖ MERV 13 efficiency to meet LEED Green Building Rating System Criteria.
- ❖ Green Pleat provides points toward LEED certification.
- ❖ Eliminates need to retrofit to achieve high MERV efficiency.
- ❖ Low resistance to airflow reduces energy costs.
- ❖ Sustainable component for a LEED/Green Building initiative.

NOVApleat

Available option: MERV 6 - 7



Description

The NOVApleat is a standard capacity air filter designed for use in nearly all commercial, industrial and health care facilities. It can be used as the primary filter, or as a pre filter to higher efficiency final filters. The NOVApleat is suitable for environments ranging from dry and harsh to high humidity.

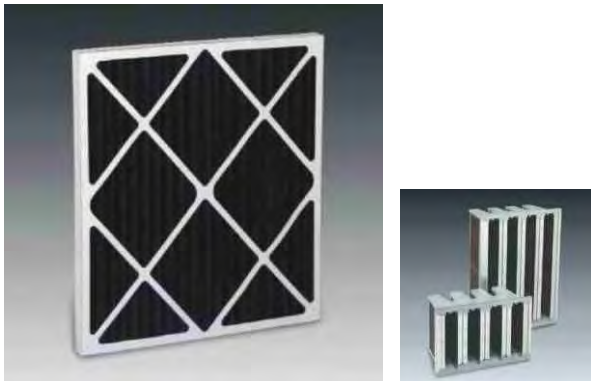
The NOVApleat HC (High Capacity) offers increased efficiency and considerably more surface area for applications requiring higher levels of efficiency and service life.

Advantages

- ❖ Precision machine fabrication for consistent quality.
- ❖ 100% metal free design.
- ❖ Crush resistant media.
- ❖ Center support strut eliminates breaching.
- ❖ New design dramatically reduces shipping damage.
- ❖ Square pleat tip provides added rigidity.
- ❖ Achieves MERV 7 (per ASHRAE Standard 52.2).
- ❖ Protected by U.S. patent numbers 7,156,891 and D544,949.



Spectra Gas Phase



Description

Spectra Gas Phase IAQ filter is a versatile, high efficiency combination filter (particle and molecular) used to effectively remove odor associated with diesel fumes, hydrocarbons, tobacco smoke, body odors, cooking and Volatile organic compounds (VOC) in public and commercial buildings.

Advantages

- ❖ Improve indoor air quality through effective elimination of contaminants, odors and gases.
- ❖ Combined filtration particular and molecular.
- ❖ Provides the highest quality indoor air to building occupants.
- ❖ Extended service life provides lower operating costs.

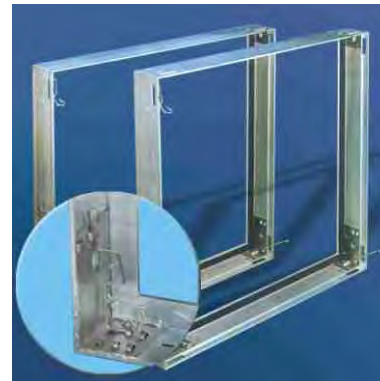
Adsorptive Capacity for Vapor Contaminants

| Category | Rating | Adsorptive Capacity and Weight Capacity % | Average |
|----------|----------|---|---------|
| 1 | High | 20 to 50 % | 35 |
| 2 | Good | 10 to 20 % | 16 |
| 3 | Moderate | Less than 15 % | 8 |
| 4 | Low | Usually to low to be effective** | |

* Sufficient for most applications

** Impregnated carbon may be required if applicable

Universal Holding Frame



Description

Spectrum Universal Filter Holding Frames are designed for simple and cost-effective construction / remodeling of filter banks. Its unique modular design is ideal for quick and hassle free installation at site. The frames come in a variety of standard sizes and can also be delivered in custom made sizes. The frames come with 4 quick clamp spring clips to ensure positive seal. The holding frames are available in Extruded Aluminum, Galvanized and Stainless Steel construction. A silicone free gasket is provided with the holding frame.

Advantages

- ❖ Variations available to fit Spectra Pocket filter (25mm), Spectra Pre Filter (50mm), combination Pre Filter + Pocket (50mm + 25mm) and for 150mm and 300mm deep HEPA filters.
- ❖ Self adhesive polyurethane gaskets provides a positive seal between the filter and holding frame.
- ❖ A choice of holding clips is available to accommodate different types of filters. These clips are designed to hold almost all types of Pre / Fine filters within the Universal holding frames. Filter installation with these clips is easy and eliminates the use of time consuming nuts & bolts. Filter change time is reduced by more than 75% in most cases.

| APPLICATION AREAS | | SUGGESTED FILTERS |
|------------------------------|--|--|
| SURFACE FINISHING TECHNOLOGY | <ul style="list-style-type: none"> 1 Car Plants 2 2 Wheelers 3 Trucks & LCV 4 Tractors & Construction Equipment 5 After Market Booths / Body Shops | <ul style="list-style-type: none"> A Coarse Filter <ul style="list-style-type: none"> i) Spectra Pre (Pad, Pleated) ii) Spectra Pocket AP, FP, FPS B Fine Filter <ul style="list-style-type: none"> iii) Spectra Pocket AP, FP, FPS, PU C Filter Housing <ul style="list-style-type: none"> iv) Universal Holding Frame D Specialty Filter <ul style="list-style-type: none"> v) Ceiling Diffusion Filter Mat vi) Paint Arrestance Media vii) Spectra Roll filter viii) Spectra HT ASHRAE & HEPA Filter |
| CLEAN ROOMS | <ul style="list-style-type: none"> 6 Pharmaceutical Plants 7 Semi-conductors 8 Medical Equipments 9 Biotechnology 10 Operation Theaters 11 Food & Beverage 12 Research & Laboratories 13 Image Processing Industries | <ul style="list-style-type: none"> A Coarse Filter <ul style="list-style-type: none"> i) Spectra Pre (Pad, Pleated) ii) Spectra Pocket AP, FP, FPS B Fine Filter <ul style="list-style-type: none"> iii) Spectra Fine (Pleated) iv) Spectra Pocket AP, FPS, SMF v) Optipleat vi) Spectra Cell vii) Spectra Cell V viii) Sub HEPA ix) Spectra Cell Compact x) Geopleat C HEPA Filter <ul style="list-style-type: none"> xi) Spectra Guard HEPA (Lite, Standard, Hi-Flow, Super Flow) xii) Spectra Minipleat HEPA (Standard, Hi-Flow) D Filter Housing <ul style="list-style-type: none"> xiii) Universal Holding Frame xiv) Ceiling HEPA Housing xv) Bag In Bag Out xvi) Spectra Cell V Bank E Specialty Filter <ul style="list-style-type: none"> xvii) Spectra HT ASHRAE Filter xviii) Spectra HT HEPA Filter xix) Spectra Gas Phase Filter |
| COMFORT AIR | <ul style="list-style-type: none"> 14 Green Buildings 15 Facilities Management 16 Residential buildings 17 Museums 18 Hotels 19 Hospitals 20 Airports 21 Railway coaches 22 Underground railway stations 23 School and university buildings 24 Underground parking spaces | <ul style="list-style-type: none"> A Coarse Filter <ul style="list-style-type: none"> i) Spectra Net ii) Spectra Pre (Pad, Pleated) iii) Nova Pleat iv) Spectra Pocket AP, FPS B Fine Filter <ul style="list-style-type: none"> v) Spectra Fine (Pleated) vi) Green Pleat MERV 13 vii) Spectra Pocket AP, FPS, SMF viii) Optipleat ix) Geopleat x) Spectra Cell xi) Spectra Cell V xii) Sub HEPA xii) Spectra Cell Compact C Filter Housing <ul style="list-style-type: none"> xiv) Universal Holding Frame D Specialty Filter <ul style="list-style-type: none"> xv) Spectra Gas Phase Filter |

| APPLICATION AREAS | | SUGGESTED FILTERS |
|-------------------------|---|---|
| TURBO MACHINERY | <p>25 Gas Turbines</p> <p>26 Compressors</p> <p>27 Diesel Engines</p> | <p>A Coarse Filter</p> <p>i) Spectra Pad - GF</p> <p>ii) Spectra Pocket - PU</p> <p>iii) Spectra Pre - TM</p> <p>B Fine Filter</p> <p>iv) Spectra Pocket - PU</p> <p>v) Spectra Cell</p> <p>vi) Spectra Cell V</p> <p>vii) Opti-pleat</p> <p>viii) Geopleat</p> <p>C Specialty Filter</p> <p>ix) Spectra Auto Viscous Filter</p> <p>x) Spectra - Spin Tube</p> <p>xi) Spectra Cartridge Filters - Pulse / Static</p> <p>xii) Spectra Pad - Coalescer (Glass / Synthetic)</p> <p>xiii) Spectra Pocket - Drop Safe</p> <p>D Accessories</p> <p>xiv) Universal Holding Frame</p> |
| NUCLEAR APPLICATION | <p>28 Nuclear Power Station</p> <p>29 Nuclear Fuel Recycling Station</p> <p>30 NBC</p> <p>31 On Site Air Shelter</p> | <p>A Coarse Filter</p> <p>i) Spectra Pocket AP, FP, PU Header</p> <p>B Fine Filter</p> <p>ii) Spectra Pocket AP, FP, PU</p> <p>iii) Opti-pleat</p> <p>iv) Geopleat</p> <p>v) Spectra Cell Compact</p> <p>C HEPA Filter</p> <p>vi) Spectra Guard HEPA (Standard, Hi-Flow, Super Flow)</p> <p>D Filter Housing</p> <p>vii) Universal Holding Frame</p> <p>viii) Bag in Bag Out</p> <p>E Specialty Filter</p> <p>ix) Spectra HT ASHRAE Filter</p> <p>x) Spectra HT HEPA Filter</p> <p>xi) Spectra Gas Phase Filter</p> |
| PRECISION MANUFACTURING | <p>32 CD ROM</p> <p>33 Picture Tube</p> <p>34 Manmade Fibre</p> <p>35 Hazardous Chemicals</p> <p>36 Computer Hardware Assembly</p> <p>37 Air Separation</p> <p>38 Polyester Film</p> <p>39 Aerospace Assembly</p> | <p>A Coarse Filter</p> <p>i) Spectra Net</p> <p>ii) Spectra Pre (Pleated)</p> <p>iii) Spectra Pocket AP, FP, FPS</p> <p>B Fine Filter</p> <p>iv) Spectra Fine (Pleated)</p> <p>v) Spectra Pocket AP, FP, FPS, SMF</p> <p>vi) Opti-pleat</p> <p>vii) Geopleat</p> <p>viii) Spectra Cell V</p> <p>ix) Spectra Cell</p> <p>x) Sub HEPA</p> <p>xi) Spectra Cell Compact</p> <p>C HEPA Filter</p> <p>xii) Spectra Guard HEPA (Lite, Standard, Hi-Flow, Super Flow)</p> <p>xiii) Spectra Minipleat HEPA (Standard, Hi-Flow)</p> <p>D Filter Housing</p> <p>xiv) Universal Holding Frame</p> <p>xv) Bag in Bag Out</p> <p>xvi) Spectra Cell V Bank</p> <p>F Specialty Filter</p> <p>xvii) Spectra HT ASHRAE Filter</p> <p>xviii) Spectra HT HEPA Filter</p> <p>xix) Spectra Roll Filter</p> |



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For detailed product brochure /
performance data sheet, please contact us.

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