

Graver Technologies

Filtration | Separation | Purification

# Stratum® Series



ADVANCED MELT BLOWN FILTER CARTRIDGES



# Stratum Series

## Stratum Series Filter Cartridges

The most advanced melt blowing equipment available is used to create Stratum Series Filter Cartridges. By tightly controlling the manufacturing environment and through use of top-of-the-line microprocessors, we are able to precisely control the process conditions to produce the most reliable, consistently performing melt blown filter on the market today.

## Absolute and Nominal Rated

Stratum Series advanced melt blown filter cartridges are available in high performance grades from 0.5 to 75 microns. Whether your process requires the highest efficiency 99.9% rated Stratum A Series, or the 90% nominal efficiency Stratum C series, you can count on the most advanced performance available from a melt blown filter.

## Consistent Performance

The state-of-the-art equipment used to manufacture all Stratum Series filters produces a highly consistent product. You can count on the same performance from lot to lot and from batch to batch in your process. The microprocessor controls the temperature and humidity in the room and assures that all process conditions remain the same. The result is a consistent filter and repeatable performance in your process.

## Longer On-stream Life

The key to long on-stream life in a depth filter is optimized porosity and pore gradient. In addition the filter must be comprised of micro thin fibers to produce the finest pores needed to meet the efficiency requirements. Stratum advanced melt blowing process features a 4-zone construction to provide true depth filtration characteristics and long on-stream life. By achieving just the right amount of thermal bonding from fiber to fiber, the filter pore structure is maintained even under variable process conditions and as differential pressure increases.

## Molded Center Core

Rather than compact fibers to form a support structure, like some common melt blown filters, the Stratum Series filters are constructed using a proprietary molded polypropylene center core called the "Cactus Core". Not only does this core provide enhanced collapse resistance but it also eliminates the flow restriction inherent with a compacted fiber zone. The small stipples on the core surface, that give the Cactus Core its name, also ensure media immobilization to prevent fiber shifting and contaminant unloading.

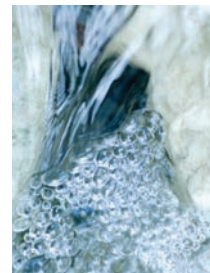
## High Purity Construction

Stratum filters are made with 100% virgin polypropylene and are free of surfactants, binders and adhesives. They are manufactured in a controlled environment to prevent contamination. The chemically inert polypropylene assures that the Stratum filters can be utilized in a wide range of applications, including the most critical of processes. Stratum filters are constructed of FDA listed materials and tests prove they meet the requirements of USP Class VI. Spent filters can be incinerated to trace ash.



# Applications

Stratum Series Filters meet the requirements of the most demanding applications.



## Chemical/Industrial

Bulk and fine chemical filtration, process water, acid filtration, make-up water, sodium hypochlorite, ink jet inks, coatings, machine coolants, plating solutions, glycol recovery

## Microelectronics

Pre-RO filtration, bulk chemical filtration, CMP slurries

## Water

Process, pre-RO, ultrapure water prefilters, wastewater

## Food and Beverage

Bottled water, wine prefiltration, DE trap, resin trap, carbon trap, bottle wash water, flavorings, pre-RO

## Cosmetics

Mouthwash, lotions, fragrances

## Pharmaceutical/Biotech

Utility water, pre RO, ultrapure water systems

## Oil & Gas

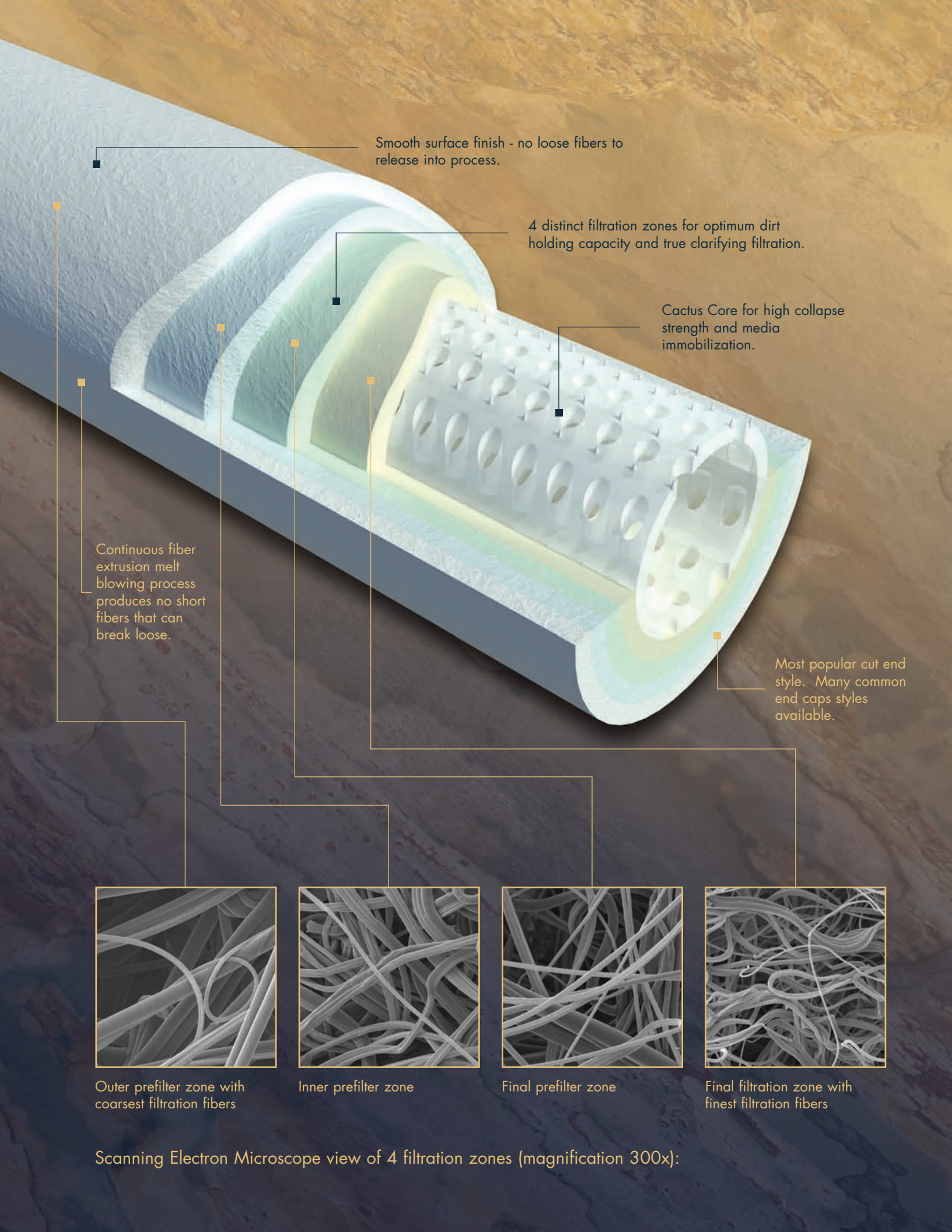
Water flood, natural gas filtration, water disposal, amine regeneration

## Chemical Compatibility

Chemical Class	Excellent	Good	Suggest Testing
Water (ambient)			
Organic acids			
Inorganic acids			
Alkalies			
Solvents			
Steaming			
Oils			

*This data is provided for informational purposes only and is not intended as a warranty or guarantee. Graver Technologies assumes no responsibility in connection with use of this data. Consult with Graver for specific chemical resistance information and filter selection.*





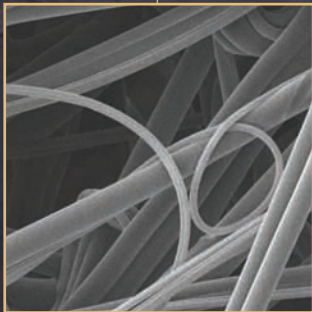
Smooth surface finish - no loose fibers to release into process.

4 distinct filtration zones for optimum dirt holding capacity and true clarifying filtration.

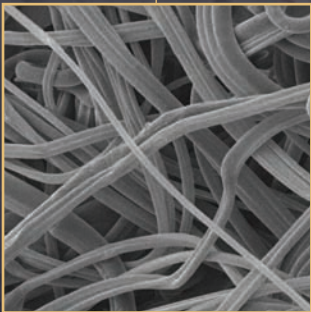
Cactus Core for high collapse strength and media immobilization.

Continuous fiber extrusion melt blowing process produces no short fibers that can break loose.

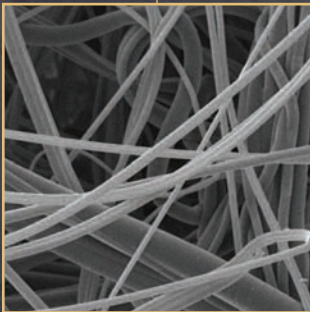
Most popular cut end style. Many common end caps styles available.



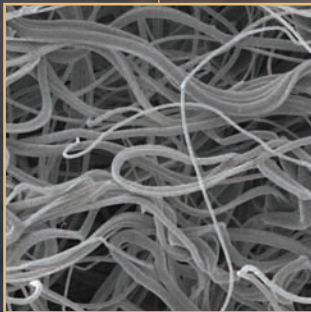
Outer prefilter zone with coarsest filtration fibers



Inner prefilter zone



Final prefilter zone



Final filtration zone with finest filtration fibers

Scanning Electron Microscope view of 4 filtration zones (magnification 300x):

# Features and Benefits

Stratum Filter Feature	Performance Benefit	Customer Benefit
Ultra fine melt blown fibers	Fine micro porous structure for high removal efficiencies	Precise and highly consistent filtration efficiency
Microprocessor controlled process	Humidity and temperature controlled environment  Consistent construction/performance from lot to lot  Highly engineered construction	High yields in your process/reduced defects  Very precise performance
Molded "cactus" center core	Higher collapse strength  Excellent flow characteristics  Stipples aid in media immobilization	Ability to operate at higher differential pressures  Uniform filtration results  No unloading of captured contaminant
4-zone construction	Prefiltration and final filtration in one  True graded depth filtration characteristics	Lower filtration costs  Long on-stream filter life
100% pure polypropylene materials of construction	Excellent chemical compatibility  Biologically inert	Negligible extractables  Use in a wide range of applications
FDA listed and USP class VI compliant	Filters are safe for use in food, beverage and pharmaceutical applications	Non-toxic filtration for the most critical applications
Binder, surfactant, and adhesive free	Negligible extractables  No foaming	Rinses up to 18MΩ-cm  Clean process
Continuous lengths up to 40"	No joiners to reduce media area	Long on-stream life



# Stratum Series Outperforms Competing Depth Filter Technologies

*Your process requires predictable and highly consistent removal of contaminants. While there are many types of depth filters available in the market, they do not all deliver the highest performance. Compared to competing technologies, Stratum Series provides the most reliable and advanced performance available in a depth filter.*

## String Wound filters

String winding is one of the oldest filter technologies and has a number of shortcomings. First, the string itself is coated with a lubricant or surfactant to make winding easier. These lubricants then rinse off the filter on a continuous basis when installed in your process. In fact, it is very difficult to remove it entirely, so most users that value high purity will avoid this technology.

Also, string wound filters are comprised of a woven string, containing short fibers that can release downstream into your process fluid. These fibers also tend to be large in diameter, compared to what a melt blowing line can make. The larger fibers pack to create inherently larger pores, making it impossible to achieve fine efficiencies.

Inconsistent and imprecise performance is a particularly concerning issue with string wound filters. Lab testing of 5 micron labeled products revealed true 90% removal efficiencies of 25 micron or worse.

## Molded Depth Filters

Molded depth filters contain a single size fiber throughout the filter which results in uniform pores through the filter's depth and no pore gradient. The result is that all contaminant collects on the filter surface instead of penetrating into the filter depth.

Thus molded depth filters are essentially low area surface filters with all dirt collecting on the outside 0.5 square feet of area (per 10" filter). The lack of gradient, and resulting surface capture of dirt, results in much lower filter dirt holding capacity and shorter on-stream life cycles.

Other types of molded depth filters have grooves cut into the outer surface, which generate loose fiber that can migrate into your process. The grooves also reduce the filter's depth, leading to lower dirt holding capacity and lower initial efficiency.

## Conventional Melt Blown Filters

The process of making melt blown filters originated in the 1970's and several big name filter companies continue to sell products made on these archaic processes. These older lines use a single fiber extruder to create a graded density structure. They create a gradient by tightly packing the fibers together to create smaller pores in the inside zones and more loosely packing the fibers to make bigger pores in the outside zones.

This is in sharp contrast to advanced melt blowing processes that use multiple extruders to make finer fibers for inside zones and coarser fibers for outside zones and do not rely on packing density to create fine pore structures. In the conventional process, the densely

compacted filtration zone causes reduced flow and dirt holding capacity. A wise consumer will buy melt blown filters with a graded pore structure, not graded density, for optimum performance.

Adding further to the flow restriction, many conventional melt blown filters do not use a hard molded center core for structural support. Instead they create a support structure by densely compacting fibers, which results in moderate to severe flow restriction, a loss of usable filtration area, and lower collapse strength, especially at elevated temperatures.

Older melt blowing lines also are not capable of producing the ultrafine fibers required for the finest removal ratings and so performance may be less than desired.

Finally, even some of the newer melt blowing lines may not produce a consistent product. The melt blowing process is highly sensitive to changes in room temperature and humidity so should not be run in an open factory environment. In addition, it is essential to precisely control the many process inputs and to maintain process stability by using advanced controllers. Only then will the same product result time after time.







## The Graver Advantage

Graver Technologies, LLC is a US based company serving the industrial filtration, separation and purification needs of companies around the globe. Established over three decades ago, Graver develops, manufactures and markets a wide array of products and services for the power generation, food and beverage, drinking water, pharmaceutical and chemical markets. Our products are used to efficiently remove particulate and soluble contaminants from a range of gases and fluids. At Graver we strive to understand the needs of our clients and specialize in providing innovative solutions for critical processing needs.

Graver Technologies is headquartered in Glasgow, Delaware and has manufacturing and marketing facilities in Newark, New Jersey, and Honeoye Falls, New York.

Graver Technologies is ISO 9001 Registered and operates under a strict quality management system focused on continuous improvement.

Graver Technologies is a Member of the Marmon Group of companies, an international corporation with over \$7 Billion in annual sales.

©2009 Graver Technologies LLC.



### Corporate Headquarters

200 Lake Drive  
Glasgow, Delaware 19702 U.S.A.  
Telephone: 302-731-1700  
Fax: 302-369-0938  
E-Mail: [info@gravertech.com](mailto:info@gravertech.com)  
Website: [www.gravertech.com](http://www.gravertech.com)

### For more information

Graver Technologies Customer Service: **1-888-353-0303**

Technical Support: **1-800-510-0932**

E-mail us at **[info@gravertech.com](mailto:info@gravertech.com)**

Graver Technologies Europe (UK): **+44-1424-777791**

All information and recommendations appearing in this bulletin concerning the use of products described herein are based on tests believed to be reliable. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Graver Technologies as to the effects of such use or the results to be obtained. Graver Technologies assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. Stratum is a trademark of Graver Technologies, LLC.



**Graver Technologies**

A member of The Marmon Group – A Berkshire Hathaway Company



GTX-326 4-09