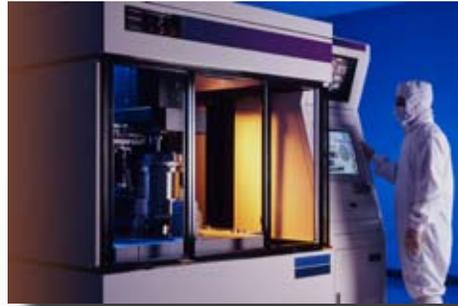




Graver Technologies

HEPA Filtration Products



HEPAfine®

*High Efficiency Particulate Air Filters for
your most demanding applications*

ULPAfine®

*Ultra Low Penetration Air Filters for
your most critical applications*



Reliable

HEPA[®]*fine*

High Efficiency Particulate Air Filters for your most demanding applications

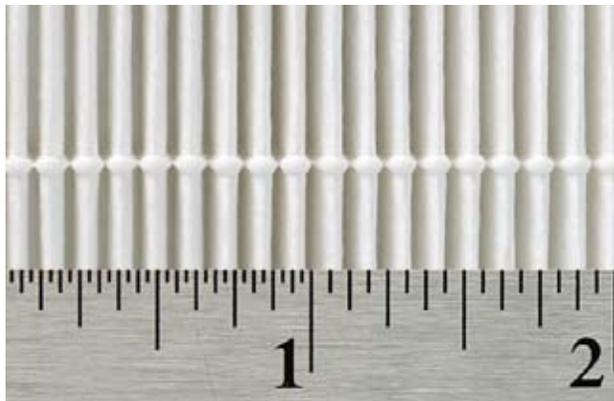
ULPA[®]*fine*

Ultra Low Penetration Air Filters for your most critical applications

The Graver Technologies HEPA[®]*fine* and ULPA[®]*fine* line of filtration products are designed to meet the stringent demands of critical environments in commercial, industrial, institutional and residential applications.

As applications evolve and move out of conventional "clean room" environments and miniaturization continues to expand, there are increasing requirements for HEPA and ULPA performance to protect users, patients, instrumentation and electronics.

HEPA[®]*fine* and ULPA[®]*fine* filters offer features to assure a balance of efficiency, flow and durability that are unique in the industry. Only the finest materials with the highest performance standards go into each of our products. **And most of our filters now carry the UL900 certification!**



Mini Pleat Pack Advantage

Pleat packs are designed to offer the highest combined flow characteristics and efficiency, and are available in multiple configurations, up to 9 pleats per inch.

Our pleating process is flexible and allows us to produce packs as low as 4.5 pleats per inch.

Sturdy Construction

Our filters have extruded aluminum frames with mitered corners and leak free joint caps. This design offers a more robust assembly and reduced opportunity for air bypass. And the pleat packs are bonded to the extrusion at every point, assuring complete encapsulation of the pack.



Our experience tells us that the filter is only as efficient and reliable as its handlers allow it to be. So, we build them as strong as we can to make sure your performance expectations are met.

Evolving Applications

The world of electronics is not the only application or market that has evolved over the past 20 years. More recently, the world of instrumentation, power generation, healthcare, vacuums, dust collection and home air cleaning has demonstrated quantum leaps in progress. And of course with progress comes change, and demands for products to meet the new challenges to air quality.

Graver Technologies continues to identify, design and develop products to meet these challenges and to help users overcome the obstacles created by the need for cleaner air in less conventional environments. Offices are becoming the new norm for production whether it is for manufacturing or healthcare.



And, of course, there are continued demands in pharmaceutical, food processing, semiconductor and biotechnology, each of which has their own growing need for performance improvement, including material composition to reduce the effect extractables can have on processing.

Technologies

Graver Technologies has a Media Technology Group that is working diligently to identify and develop products that will respond to the demands of the next generation products and applications. This includes nano-fiber technology, membranes and composite media that include the ability to adsorb odors and chemicals. The combination of the two forms of filtration is unique in the industry and a significant advantage when dealing with reduced equipment footprints.

Graver Technologies takes great pride in focusing our product development to meet current, as well as next generation, applications.

Our filter products are designed with the customer in mind. During the development phase, we often reach out to the industry to generate feedback in an effort to assure products are designed for immediate use, with the goal of improving overall performance and cost.



When you are faced with an air quality problem, Graver Technologies is your source for remediation. We can build filters in cylindrical, rectangular or circular configuration to meet the application footprint.

All our products can be designed to meet proprietary efficiencies and pressure drops regardless of the application. We build to **your** requirements.

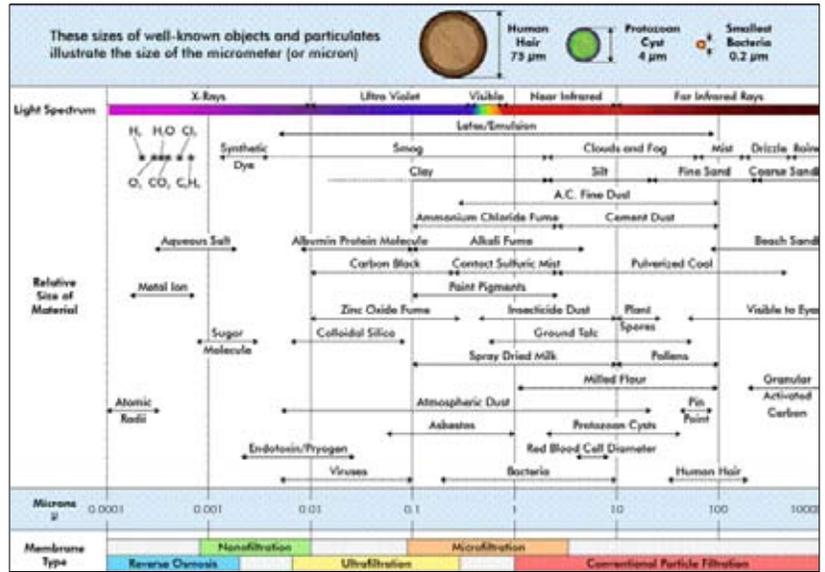


Performance

To better understand the performance requirements of HEPA and ULPA filtration, it is important to define what the target contaminants for removal are in terms of size and composition.

This illustration identifies the relative sizes of common particulates and objects that we are exposed to. Conventional filtration is generally effective in the size range of 1 micron (μ) and above, many of which are in the size range visible to the naked eye. We are focused on much smaller particles.

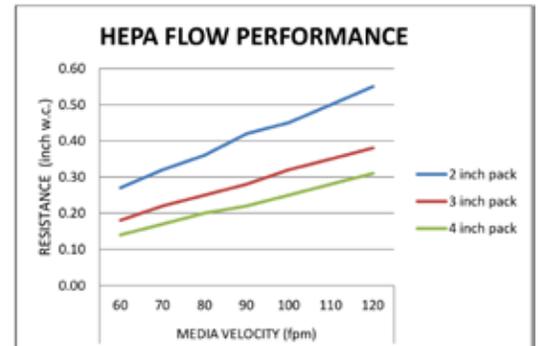
HEPA[®] and ULPA[®] filters are designed to remove particles in the ranges of 0.1 - 0.3 μ . This level of filtration is considered microfiltration.



Air Flow

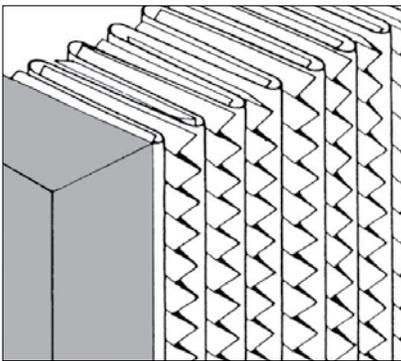
HEPA[®] and ULPA[®] filters are exposed to a multitude of air flow conditions. Whether they are installed in a ceiling for semiconductor clean rooms, pharmaceutical vial filling stations, industrial vacuum and dust collecting applications, or biological clean bench equipment, resistance to air flow is increasingly becoming the most important consideration when evaluating filters.

And as equipment footprints continue to shrink, so does the space for filters. As a result, resistance to air flow continues to be a critical component in determining the suitability of these high efficiency filters, especially when either designing new, or upgrading existing equipment.



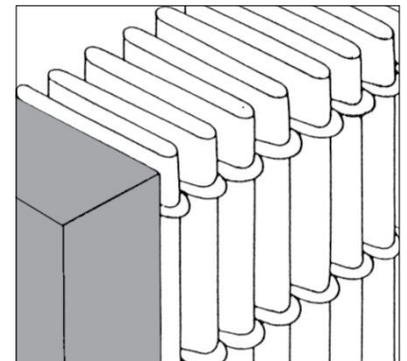
The technical data indicated above represents typical data and does not form a specification. Actual filtration performance will vary by test conditions and filter design.

Bead Separator Advantage



HEPA[®] and ULPA[®] filters are constructed using mini pleat packs with a hot melt adhesive separator to assure pleat straightness. This design offers the highest amount of media surface area for the flow and thus provides significantly lower pressure drops when compared to corrugated separator filters.

As equipment footprints continues to shrink, the demand on reducing the size of filters continue to grow. Our mini pleat design offers the best solution.

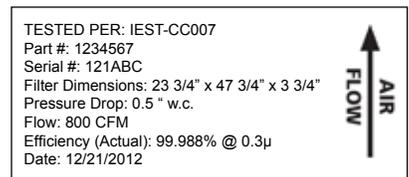


Quality Control

Raw Materials

HEPA^{fine}® and ULPA^{fine}® filters are manufactured to meet the strictest application requirements in the industry. The quality of materials going into our filters thus has a significant impact on the success of our products' performance. The media selected is designed to provide the level of removal efficiency and performance assurance as defined by the customer. The media can be produced from a multitude of raw materials, but generally comes from formulations of borosilicate microfibers in a wet-laid process. It is factory tested at the manufacturer to meet the highest efficiency standards before being shipped to Graver Technologies for assembly into filtration products. Flat sheet performance is critical if we are to meet the final filter performance expectations of the customer.

Every HEPA^{fine}® and ULPA^{fine}® filter undergoes a battery of tests to assure the final product will meet desired performance requirements. This includes an overall efficiency test using DOP or PAO, and/or a scan test. The final product is then labeled, indicating the level of performance the filter exhibited during the testing process. This label includes the actual efficiency and flow resistance, air flow, dimensions and lot/serial number.



Efficiency vs Flow

Graver Technologies places equal importance in developing and testing all its HEPA^{fine}® and ULPA^{fine}® filters for flow performance, not only efficiency. When we are provided with a specification that requires a target resistance, we have the ability to change the pleat pitch, the pleat height, as well as the media type to meet the target values. This often allows for the flexibility needed to help the end user develop and market smaller equipment footprints. Currently this is one of the industry's most challenging obstacles to upgrading air quality in existing applications.

Quality First

At Graver Technologies, we place great pride in assuring the quality and performance capability of all our products. Materials (media) used are lot tested before entering our manufacturing facility. These tests assure that performance targets are met before processing into final filters. We use first grade framing systems, as well as adhesives designated for the application, to assure our products not only meet the target application's requirements, but also avoid having the filter become a contaminating contributor to the process. **Our Quality Management System is ISO controlled and second to none in the industry!**



The media pleating process is housed in an environmentally controlled room. The packs are measured for straightness, pitch, height and overall aesthetics. The packs are then assembled into filters which are tested in a state-of-the-art test tunnel using an overall particle penetration efficiency test or a scanned particle penetration efficiency test. Every filter is then identified by a serial number that can be lot-traced for quality assurance and performance guarantee.



Graver Technologies has invested significant capital in the development and processing of HEPA^{fine}® and ULPA^{fine}® filters. We strongly believe these products are the answer to the world's evolving needs in addressing air quality. We will continue to invest in all aspects of this product line and assure you that our commitment to quality will always be our number one priority!



Graver Technologies

The Graver Advantage

Graver Technologies is a US based company serving the industrial filtration, coalescing, 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, industrial, food and beverage, drinking water, pharmaceutical and chemical markets. Our products are used to efficiently remove particulate and soluble contaminants from a wide range of gases, air and fluids.

At Graver Technologies, we strive to understand the needs of our customers and specialize in providing innovative solutions for all their processing needs.

We are committed to total customer satisfaction.

Graver Technologies is ISO 9001:2008 certified and operates under a strict quality management system focused on continuous improvement. Graver is headquartered in Glasgow, Delaware and has additional manufacturing and marketing facilities in Honeoye Falls, New York and Newark, New Jersey.

Graver Technologies, LLC is a Marmon Water/Berkshire Hathaway company.

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