

### **Superior Products & Global Reach**

Whether your business is around the corner or around the world, Graver Technologies can support you with superior products and services. Our ion exchange, adsorbent, filtration, and membrane products deliver exceptional performance in some of the harshest process environments in North America, Europe, Asia, the Pacific Rim, South America, and Africa.

Graver Technologies is a member of The Marmon Group (a Berkshire Hathaway Company), an international group with more than \$7 billion in annual sales. Around the corner or around the world, Graver Technologies is a fast growing company with the technical resources and financial strength that make us the perfect partner for your business.

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### www.gravertech.com

KRISTAL™ is a trademark of Hyflux LTD.

INOCEP™ is a trademark of Hyflux LTD.

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A member of the Marmon Group – A Berkshire Hathaway Company



# Filtration | Separation | Purification





# OEM, Private Label, and Custom Filters

Graver Technologies designs and produces custom filters for Original Equipment Manufacturers (OEM), as well as private label products. Our custom products range from pleat packs to filter element assemblies, complete elements, and engineered filtration systems.

We serve various markets, including manufacturers of:

- Ultrapure Water Systems
- Medical and Healthcare Devices
- Consumer and Industrial Vacuum Cleaners
- Print Engines for Commercial and Office Use
- Room Air Purifiers
- High Performance Air Intake and Fuel Delivery Systems

#### FILTRATION ENGINEERING™ Filters for Vacuum Pumps and Pneumatic Conveying

The FILTRATION ENGINEERING (FE) product line addresses applications for vacuum pumps, including mist elimination and inlet air filtration. The FE PulseJet™ self-cleaning systems are designed for use in pneumatic conveying applications where high value product must be recovered.

#### AEGIS Elements for Condensate Filter Systems

The original wound POWDEX filter elements are available with a variety of end fitting designs to fit the different POWDEX systems. The AEGIS AFA® cartridge is designed for use in condensate systems that do not require resin precoats or systems that are precoated, and AEGIS DualGuard filters are available in absolute ratings ranging from below 1.0 to above 20 microns. Like all Graver Technologies' condensate filters, a variety of end fittings can be added to retrofit the elements in existing POWDEX® systems or other condensate filter systems.

# KRISTAL™ Polymeric Hollow Fiber Membranes and Modules

The unique KRISTAL™ polyethyersulfone hollow fiber membranes are designed to insure consistent filtration of streams with very high suspended solids and colloidal content. Our hydrophilic membrane products are ideal for a wide range of municipal and industrial applications, especially for pre-treatment to reverse osmosis (RO).

#### SCEPTER® Stainless Steel Cross-Flow Membranes for Extreme Process Conditions

SCEPTER stainless steel cross-flow membranes feature a patented coating to provide a highly durable filter medium for superior separations and reliable performance under extreme process conditions. SCEPTER's tubular cross-flow design and stainless steel construction make it practically bulletproof, thus allowing it to be used on a wide variety of difficult streams with a broad range of chemical conditions, pressures, and temperatures.

# INOCEP<sup>™</sup> Ceramic Hollow Fiber Membranes and Modules

The INOCEP™ ceramic hollow fiber membranes are known for their resilience and durability under highly demanding separation conditions such as high temperature, pressure or aggressive solvent applications. Compared to conventional tubular and multiple channel membranes, INOCEP™ offers higher flux, higher energy efficiencies and smaller footprints.

#### **Industrial Filtration Products**

IFD filters are used in chemical and petrochemical processing applications, industrial gas production, and power generation. A wide range of products is available for compressed gases and liquids in process applications. Industrial Filtration Products are the choice for the protection of rotating equipment, including turbines, compressors and blowers. Graver Technologies produces pressure vessels to ASME code, Section VIII, Division I and PED 97/23/EC.

#### **Engineered Projects**

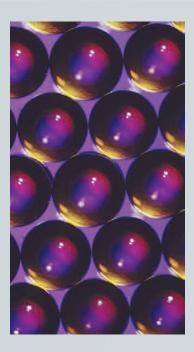
Graver Technologies designs filtration systems for various applications, including: Power Generating Turbines, Vacuum Pumps, Precious Metal Catalyst Recovery, Pneumatic Conveying, Industrial Gas Production, and Chemical Processing. Numerous manufacturers of turbines, pumps, and compressors count on products from Graver Technologies to meet their OEM requirements for coalescing and particulate filtration.







### **PRODUCTS**







#### **ION EXCHANGE PRODUCTS**

Graver Technologies designs, processes and manufactures a wide range of ion exchange products. While these products and services are focused on the power generation market, they are also used for petrochemicals, pharmaceuticals and industrial waters. The primary application is contaminant removal from condensates, wastewaters, other power plant streams, and process waters.

Graver Technologies provides six major product and service categories to the aforementioned markets. GRAVEX® bead resins are used for all ion exchange resin applications. POWDEX® and ECODEX®, powdered resin products complement the AEGIS® Filter product line, forming a synergistic, precoat filter demineralizer system. RADEX® bead and powdered products selectively remove radionuclides from liquid radwaste. Advant-IX<sup>TM</sup> Toll Resin Processing and Laboratory Services are offered to all customers. Toll process regeneration and rinsing services attain the highest purity levels for all applications, including Nuclear and Ultra Pure Water (UPW) grade resins.

#### **ADSORBENT PRODUCTS**

# ECOSORB® Multi-Functional Media and Cartridges

ECOSORB products are multi-functional purification media that combine adsorption, filtration and ion exchange for innovative process solutions. ECOSORB products are used to remove a wide range of organic and inorganic contaminants from process fluids in the food and beverage, pharmaceutical, metal finishing and power generation industries.

Ecosorb-PAK<sup>™</sup> products are one of Graver's newest innovations. Ecosorb-PAK cartridges provide high performance adsorption processing for active pharmaceutical ingredients and intermediates.

Graver Technologies maintains a well-staffed research facility that can provide technical assistance and tailor formulations for unique process requirements.

#### **FILTRATION PRODUCTS**

Graver Technologies designs, engineers, and manufactures a wide variety of filtration products that address applications ranging from coarse filtration to ultra-filtration. Our filter manufacturing facilities are ISO 9001 registered, assuring you of the quality required to meet your needs.

#### Graver Technologies Filters For Liquid Process Applications

Graver Technologies process filters offer an extensive line of filter cartridges and housings to provide high performance and cost effective solutions for liquid process applications. With filters suitable for common industrial, high purity water and other critical process streams, Graver Technologies liquid process filters service a wide array of applications in the beverage, chemical, microelectronics, and biopharmaceutical markets. Our membrane filters are constructed in a state-of-the-art manufacturing facility that includes an ISO Class 7 clean room to meet the most demanding customer requirements.

Graver Technologies liquid process filters are also available in a wide range of media types, cartridge designs, micron ratings, and configurations to optimize filtration efficiency while providing dependable performance and long service life.

## Filtration | Separation | Purification

**Graver Technologies LLC** designs, develops, and manufactures an array of specialty products for critical ion exchange, separation, purification, and filtration processes. We specialize in the purification of power generation condensate, process and drinking water, and industrial fluids and gases.

# Problem Solvers in Diverse Industries

Graver Technologies offers a broad selection of high performance specialty ion exchange resins and services, proprietary adsorbents, and filters for the most demanding application environments. We also supply filtration products to manufacturers of pumps, turbines, compressors, medical devices, and consumer and industrial vacuums. Because of the breadth of our technologies and the depth of our scientific and analytical resources, we are often called upon to solve our customers' most challenging problems. Graver Technologies serves industries that include:

- Process Water
- Power Generation
- Food & Beverage
- Drinking Water
- Pharmaceutical
- Chemical

#### ISO 9001 Registered

We manufacture products to meet the most rigorous global standards, including:

- 10CFR50 App.B- Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
- ASME Section VIII, Division I
- PED 97/23/EC

#### **Global Presence**

Exporting on average more than 35% of our products, Graver Technologies is recognized worldwide. Our global presence extends from North and South America, across Europe and into Asia-including the Pacific Rim, Japan, and Australia. We are headquartered in Glasgow, Delaware, with additional manufacturing and marketing facilities in Newark, New Jersey; Honeoye Falls, New York; Stuttgart, Germany; and Shanghai, China.

#### Resources

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### **MARKETS**

Graver Technologies provides products and services that meet stringent application requirements in a variety of markets, including Process Water, Power Generation, Food & Beverage, Drinking Water, Pharmaceutical, Microelectronics and Chemicals.

#### **PROCESS WATER**



Aqueous streams are common to many industrial processes. The selective removal of a broad range of contaminants enables the process fluid to be reused to increase operating efficiency and improve finished product quality. In addition, more strictly enforced environmental regulations are requiring industry to lower contaminant levels of discharge streams.

Products from Graver Technologies filter particulate matter in the process stream and reduce trace levels of contaminants. Our prefilters and final membrane filters are used to produce ultra pure DI water for semiconductor plants. Membrane products are used for clarification or concentration of high solids in waste streams. Our ion exchange and adsorbent products are ideal for heavy metals removal and recovery. Graver's industrial products are designed for applications where high dirt loading and flow rates make standard filter cartridges ineffective.

#### **POWER GENERATION**



Today, new challenges exist in the power generation industry. Demands for higher levels of purity in condensate, reactor water clean up and other critical applications have elevated product performance requirements to new levels. As the world leader in condensate polishing technology, Graver's ion exchange and septa products are ready to meet these challenges.

Graver Technologies is the premier supplier of kinetically superior and high purity ion exchange resins to meet the demanding needs of the nuclear power industry. Our condensate polishing septa technology is the leader in both precoat and CRUD removal applications for both nuclear and super critical fossil plants. Our industrial filter products address the fuel gas issues required for gas turbines to meet today's stringent exhaust gas regulations.

For nuclear, fossil, gas or liquid fuel turbines, and centralized or distributed power generation, Graver Technologies has the products to ensure efficient, economical, and environmentally friendly operation.

#### DRINKING WATER



Recently, the U.S. Environmental Protection Agency mandated by law that all drinking water systems meet the new arsenic standard of 10 parts per billion.

Our patented METSORB<sup>TM</sup> adsorbent products have been specifically engineered to provide excellent Arsenic, Lead and other Heavy Metal contaminant removal for the purification of drinking water, process water and other critical purification applications.

METSORB HMRG is a highly effective granular adsorbent that removes arsenic III & V, and a wide variety of heavy metals including Lead, Cadmium, Copper, Chromium+6, Selenium, and Zinc from aqueous sources. METSORB HMRP is a powdered form of the adsorbent that is effective for lead and heavy metal removal in carbon block. METSORB utilizes a patented Titanium compound to adsorb both forms of arsenic as well as a wide range of contaminants in water.

Metsorb maintains a higher capacity and a lower level of ion interference than competitive iron and alumina based products. The media is long-lasting and upon exhaustion, has consistently tested non-hazardous for disposal classification. The media is NSF Standard 61 approved, and has received regulatory approval from agencies across the United States and Canada.

Graver Technologies' products can be found in many OEM applications where products are custom designed to meet the exacting requirements of the equipment manufacturer. Our OEM filters serve the rotating equipment markets as well as manufacturers of medical devices, office equipment, and consumer and industrial vacuum manufacturers.



The purification of ingredients and final products by the food and beverage industry is essential to meet consumer demand for consistent, high quality goods.

Graver Technologies develops products that are used extensively in food and beverage processing including purification and clarification of sugars, syrups, juices, fermented beverages and distilled spirits. You can turn to Graver Technologies when you need to reduce color or undesirable tastes, odors and turbidity.

Graver Technologies also supplies products that keep processing plants operating at top efficiency. Liquid filters are used to treat process water and clarify bottled water, wine, beer and other beverages. Membrane filters remove harmful microbes. Air and gas filters ensure clean make-up air, and self-cleaning filters keep pneumatic conveying systems operating at peak efficiency.



Graver Technologies offers numerous options to address various processing needs for pharmaceutical manufacturers. These include the use of adsorbents and adsorbent cartridges to remove organic and inorganic contaminants, including dissolved precious metal catalyst, in pharmaceutical API's and intermediates, and the use of cross flow membranes to remove suspended cells and solids from feedstock solutions in cell harvesting, or clarification of fermentation broths.

Graver Technologies can custom formulate adsorbent media and ion exchange resins to meet specific process requirements. Our filtration products are designed to provide high performance particulate retention while maintaining desired flow rates and low pressure drop. Our liquid filters allow for cost effective prefiltration and filtration of process grade water. Self-cleaning filter systems set the industry standard for efficiency in pneumatic conveyance systems that transport high value products and intermediaries.



The chemical processing industry faces a wide range of purification challenges. These problems include feedstock quality improvement, re-cycle of costly ingredients, by-product quality upgrade, final product quality improvement and recovery of precious metal catalysts.

Graver Technologies has a host of products that keep chemical processing facilities operating efficiently. From air intake and process filter applications to industrial gas production and wastewater treatment, Graver has products that meet your needs.

Our industrial filtration products include ASME/PED code pressure vessels that can be custom designed to meet your space and piping requirements. Our stainless steel cross-flow membranes and filters are compatible for use in most process streams. And we have products that help keep your plant operating in an environmentally friendly manner.