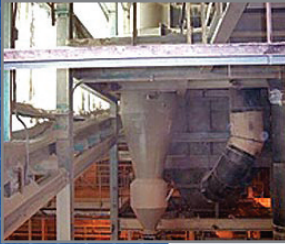




**BIONOMIC**  
Industries Inc.

*Your Clean Air,  
Product and Heat Recovery  
Solution Partner*



### **Series 2000 CycloPlus™ Collectors**

CycloPlus Collectors feature an advanced cyclone design that offers high retained solid particulate collection as either a primary or pre-cleaning particulate removal or recovery device. Units are available in single through eight clustered parallel configurations and abrasion resistant materials to handle gas volumes from 100 through 80,000 cfm.



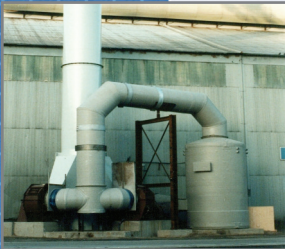
### **Series 5000 Countercurrent Packed Tower Scrubbers**

Series 5000 Packed Towers incorporate Bionomic's maximum throughput Hi-Flow<sup>sm</sup> dumped or structured packing, high efficiency mist eliminator, and clog resistant liquid distribution system that is match engineered to precisely meet particular gaseous contaminant removal and application requirements. An optional dual packed bed arrangement enables removal of multiple contaminants using different scrubbing liquid reagents within the same unit. Engineered for use with water, reactive chemical reagents or special solvent scrubbing liquids, the scrubbers provide up to 99.9% removal efficiency and are available in a full range of sizes for gas flow rates from 100 through 300,000 cfm.



### **Series 5500 Crossflow Scrubbers**

Series 5500 Scrubbers offer a low profile, horizontal design for rooftop or limited height installations. Standard Series 5500 Scrubbers include Bionomic's superior Hi-Flow<sup>sm</sup> high throughput, low pressure drop packed bed section, high efficiency mist eliminator, and clog resistant liquid distributors. For special high mass transfer, low liquid rate needs, a Max-Fil media option is available, and a complete "packaged" version is also offered with integral recirculation pumps and accessories. Ideal when less than 99% removal efficiency is acceptable, units are available for gas capacities from 300 through 50,000 cfm.



### **Series 6000 Tray Scrubbers**

Series 6000 Scrubbers utilize special high performance sieve, valve or bubble cup tray designs in single or multiple stages to achieve high efficiency gas absorption with extremely low liquid throughput. The scrubber can also remove one micron and larger size particulates, is ideal for once through scrubbing liquid applications typically required for higher vapor pressure contaminants or for acid re-concentration, and is available in sizes to handle gas capacities from 1,000 through 150,000 cfm.



### **Series 6500 Jet Ejector Venturi Scrubbers**

Series 6500 Scrubbers are ideal for low gas flows containing concentrated gaseous contaminants or particulates. They provide almost infinite turndown capability and create their own draft to eliminate the need for a fan in most cases. The scrubber features a simple, rugged design that uses a high velocity spray and large liquid to gas ratio to achieve simultaneous removal of gases and particulates down to .75 micron size. Available in single or multiple stages to maximize collection efficiency, the scrubber handles gas capacities from 5 through 60,000 cfm.



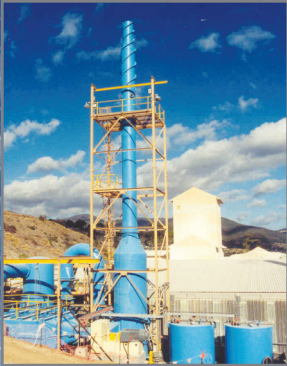
### **Series 7000/8000 Gas Atomized Venturi Scrubbers**

Series 7000/8000 Scrubbers offer maximum plug-free operation, abrasion resistance for micron and sub-micron particulate removal, and feature an advanced design throat and diverging sections that provide high collection efficiencies at reduced pressure drops. The rectangular Series 7000 Venturi Scrubber meets a wide range of applications while the Series 8000 Venturi Scrubber is ideal for sticky or scaling dusts. Both scrubbers will remove solid particulate to meet PM 10 and PM 2.5 emission standards down to 0.2 micron, and entrainment separator vessels with secondary gas treatment and cooling options are available for each scrubber type. Scrubbers are available in a full range of sizes to handle gas capacities from 500 through 460,000 cfm.



## **BFCS™ Bionomic Forced Condensation Scrubbing System**

Highly advanced Bionomic Forced Condensation Scrubbing Systems mimic the particulate capture that occurs naturally in the atmosphere through the formation of raindrops to achieve a dramatic improvement in collection of submicron particulate and secondary acid gas pollutants over conventional hot gas wet cleaning systems. Ideal for gas stream pollutants with 10% of particulate size distribution below 0.5 microns aerodynamic diameter, BFCS technology provides substantial energy savings with higher collection efficiency for all types of particulate including heavy metals, dioxins and furans typically emitted from high temperature sources. Typical applications include removal of pollutants from hazardous and medical waste incinerators, boilers, calciners, kilns, roasters, furnaces, syngas reformers/gasifiers and others. Sizes to handle gas capacities from 500 through 460,000 cfm.



## **Series 9000 Preformed Spray Scrubbers**

Series 9000 Scrubbers feature a specially designed fine droplet scrubbing liquid spray zone within a confined involute section that eliminates any bypass of untreated gas. The scrubber consumes less energy than a venturi scrubber and is designed to meet PM 2.5 and PM 10 regulations for particulates in the 1 to 5 micron range. A fully open cyclonic entrainment removal section without internal droplet removal components makes the scrubber a highly reliable, extremely low maintenance control device. The scrubber is widely used for simultaneous removal of solid and gaseous particulates, and is available in sizes to handle gas volumes from 1,000 through 75,000 cfm.



## **Series 9500 Spray Towers**

Series 9500 Scrubbers consist of a fully open vertical vessel fitted with multiple banks of swirling spray nozzles that provide simple yet highly effective 98% plus control efficiency. Specifically designed to treat acid gas emissions from particulate laden combustion flue gas, or where extremely low gas pressure drops of less than 1-1/2" w.c. can be tolerated, this scrubber is offered in a broad range of sizes to handle gas capacities from 2,500 through 500,000 cfm.



## **RotaBed™ “Fluidized Bed” Scrubbers**

RotaBed patented “fluidized bed” Scrubbers produce a unique swirl induced Coriolis effect in the scrubber’s turbulent, “packless”, highly plug resistant mass transfer bed to deliver ultra high efficiency gas absorption and particulate collection of over 99% on most applications. The scrubber features a space saving design, and is ideal for particulate laden gas streams, streams with high solids content, or scale forming scrubbing liquids including lime and limestone. A two stage chevron mist eliminator ensures complete droplet removal from the gas exiting the scrubber, and the scrubber is designed to handle gas capacities from 500 through 250,000 cfm.



## **ScrubPac™ VentClean Systems**

ScrubPac VentClean Systems are available as compact, highly efficient “complete” systems that can provide over 99% removal of storage tank and rail car vent emissions caused by breathing and filling operations. The system uses a triple action scrubbing technology, is available in four model sizes—L, M, H, and EH—to handle gas capacities from 0 to 1,500 cfm, and two unique operating configurations that easily adapt to a variety of scrubbing liquid preferences.



### ScrubPac™ ProClean Type CT Tower Systems

ScrubPac ProClean Type CT Tower Scrubbers are available as compact, “complete” scrubber system packages – inclusive of a packed tower, recirculation pump, piping, instrumentation, and integrally mounted controls. The systems require minimal field labor to install, dramatically reduce erection time and related costs, and are available in systems to handle gas capacities from 500 through 25,000 cfm.



### ScrubPac™ Custom Skid-Mounted Scrubber Systems

ScrubPac Custom Scrubber Systems are cost effective, “packaged” systems engineered to meet the exact demands of your process emission control application. All necessary components—recirculation pumps, piping and valve networks, exchangers, instrumentation, controls, and any other essential items needed to satisfy your application are supplied with the scrubber. Factory assembled, run tested and operational when they arrive on site, the systems require only process and utility connections and are available for gas capacities from 100 through 150,000 cfm.



### Dri-Scrub™ Dry and Dry/Wet Scrubber Systems

Dri-Scrub Dry and Dry/Wet Scrubber Systems provide particulate collection efficiencies between 98 and 99.9% on most applications and are normally used to scrub fine particulate with acid gases. Dry systems utilize a dry venturi scrubber followed by a pulse jet fabric filter collector while dry/wet systems utilize a pulse jet fabric filter along with a RotaBed™, Series 5000 Packed Tower or Series 7500 Spray Tower Scrubber for gas capacities from 160 through 75,000 cfm.



### ECharge™ Electrostatic Collectors

To control process or indoor emissions, the economical low energy cost ECharge™ can achieve 99.99% collection efficiencies on small micron and submicron sized particles to easily meet PM 2.5 emission regulations and OSHA requirements. For most indoor air cleaning services, the highly efficient ECharge allows the cleaned air to be recirculated back into the building to reduce utility costs. Applications include opacity reduction or elimination, removal of submicron size particles, smoke and aerosols along with odor issues caused by these pollutants. The versatile ECharge can also be used as a polishing device after an existing wet scrubber to increase particulate removal performance.



### HEI™ Wet Electrostatic Precipitator

HEI (High Energy Ionizer) Wet Electrostatic Precipitators incorporate a unique discharge electrode geometry that can be sized to different applications, and concentrate a high intensity ionizing corona in strategic areas within the collecting tubes instead of distributing it along the entire length of the tube’s treatment area. The resultant particle charging fields are two to three times stronger than conventional precipitators and deliver higher particulate charges, higher migration velocities, and a smaller precipitator size for gas capacities from 1,000 through 300,000 cfm.



### Hi-TScrub™ Quench/Scrubber Systems

Hi-TScrub Quench/Scrubber combined systems employ our advanced horizontal or vertical configuration atomized spray and venturi gas quenchers to cool corrosive hot gas streams up to 2,600°F before scrubbing. Cooled gas with acid vapors or particulate is then removed with a Series 5000 Packed Tower or Series 7000 Venturi Scrubber. All units are available as “complete” ScrubPac Custom Skid-Mounted Systems, and the scrubbers are ideal for treatment of contaminants emitted from high temperature sources including thermal oxidizers, incinerators, syn-gas production units, and furnaces to handle gas capacities from 500 through 150,000 cfm.



### **BTIP™**

BTIP extends the capabilities of natural biological treatment of gaseous organic compounds, hydrogen sulfide, odors and more with increased removal efficiency while simultaneously removing particulate if present. A unique combination of proprietary mist scrubbing, bio-scrubbing/filtration and aerobic digestion offers lowest maintenance and operating costs with self-cleaning media and nearly nonexistent chemical reagent requirements. Systems are available to meet gas handling capacities from 1,000 through 50,000 cfm.



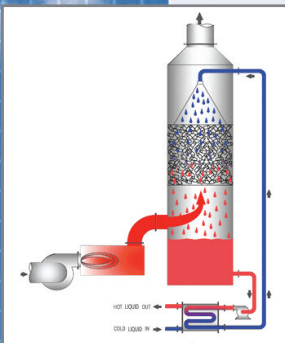
### **BIONOxSOLVER™ NOx Scrubbing Solution**

BIONOxSOLVER is the first major breakthrough process NOx control chemistry to greatly simplify wet scrubbing system operation and dramatically reduce scrubber system complexity and cost. Unlike typical NOx sulfide/caustic control chemistry, low toxicity BIONOxSOLVER will not liberate flammable and dangerous hydrogen sulfide gas at pH use conditions while achieving over 33% greater removal efficiency with a simple addition to caustic.



### **Engineered Product Recovery/Production Systems**

Bionomic has the process and systems engineering expertise and know how to provide complete modular recovery systems that enable cost effective capture and reuse of a large variety of gas stream pollutants. Hundreds of operating systems worldwide are used to concentrate acids, dimethyl formamide and alcohols, convert ammonia to ammonium hydroxide and valuable fertilizers, produce hydrosulfide from hydrogen sulfide, and convert sulfur dioxide to gypsum along with dozens of other applications.



### **QSense™ Direct Contact Waste Heat Recovery**

QSense Systems economically recover valuable waste heat from boilers, dryers, ovens, and more with a fuel savings payback within 1 to 3 years for most applications. Recovered heat can be used to preheat boiler feed water, meet or supplement building space heating requirements, or for heating process heat transfer fluids. Both sensible and latent heat is recovered for maximum recovery efficiency. As an added benefit, flue gases are scrubbed to remove any particulate and gaseous contaminants that are present to reduce plant emissions. Systems are custom designed to meet any waste heat capacity requirement.



### **ScrubSeal™ Vacuum/Overflow Valves**

ScrubSeal Vacuum Overflow Valves are the perfect overflow and vacuum seal solution to replace troublesome manometer seal legs on scrubber sumps, vessels or duct drain lines. Designed to eliminate unreliable cumbersome manometer piping, and the worry of maintaining a liquid filled line, ScrubSeal acts as a check valve to allow drainage of liquid through the overflow while maintaining required vessel vacuum during normal non-flow conditions. Available in sizes to handle flow rates from fractional to over 500 gallons per minute and vacuums up to -80 ins. w.c.



**BIONOMIC**  
Industries Inc.

777 Corporate Drive • Mahwah, NJ 07430  
Tel: 201-529-1094 • Fax: 201-529-0252  
E-mail: sales@bionomicind.com  
Website: www.bionomicind.com

Representative:

