Industrial Environmental Solutions
Gas Cleaning and Solvent Purification
Our Pedigree

Babcock & Wilcox MEGTEC (B&W MEGTEC) is a long recognized world-class supplier of environmental solutions for virtually any application where air pollution control is required. With a strong heritage of technological development and innovative solutions, B&W MEGTEC provides reliable and energy-saving systems for new or upgrade, simple or complex, large or small projects.

Our Heritage

In 2014, B&W MEGTEC became part of the Babcock & Wilcox (B&W) family of companies and the benefits are truly significant. In addition to our well-known environmental product lines for gas cleaning and solvent purification, B&W MEGTEC now offers a full suite of emissions control solutions, drawing from the Babcock & Wilcox portfolio of industrial environmental technologies. In addition to its oxidizer and solvent recovery systems for volatile organic compound (VOC) and odor control, the B&W MEGTEC product portfolio now includes efficient and dependable acid mist and particulate control solutions, techniques to control acid gas emissions, including HCl and sulfur oxides, powdered activated carbon injection for mercury control, and NOX control solutions.

Our Experience

B&W MEGTEC’s experience covers a wide spectrum of industrial applications: steam and industrial power boilers, non-ferrous metallurgical/sulfuric acid plants, steel mills, cement plants, organic and inorganic chemical applications, petroleum refineries, pulp and paper mills, biomass combustion, waste incineration, waste-to-energy applications and many other industrial manufacturing processes. Combined with our proven wet scrubbing and oxidation technologies, we are now able to offer a suite of multi-pollutant control solutions.

Lifetime Support

B&W MEGTEC’s aftermarket team of professionals have years of experience with a complete understanding of what it takes to keep your equipment and systems running at optimal performance. Our team of experts can provide process optimization services that can help you reduce operating costs. They can recommend replacement or upgrades that can help to extend the life of your equipment. And, with more than 150 service professionals located worldwide, we are available to provide excellence in customer service as well as keeping you stocked with parts for your inventory or in an emergency.

Learning from the experts within…

The B&W companies are masters in project execution. Together, the B&W family of companies provide project-rich expertise with decades of experience and thousands of projects executed on time and within budget.
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<th>Emission/Process</th>
<th>Technology Solution</th>
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| **VOCs/CO/HAPs** | Oxidizers: Regenerative Thermal (RTO)  
|                  |                    | Regenerative Catalytic (RCO)  
|                  |                    | Recuperative Catalytic  
|                  | Solvent Recovery Systems: Concentrator Systems  
|                  |                    | Condensation Systems  
|                  | Wet Scrubbers: Spray, Tray and Packed Towers  
|                  | Adsorption Systems: Non-Regenerative Carbon Adsorption  
|                  |                    | Molecular Sieves  
|                  |                    | Zeolite  
|                  | Biological Abatement: Bioscrubbers/Bioreactors  
| **Particulate**  | Dry Electrostatic Precipitators (ESP)  
|                  | Multiclone® Dust Collectors  
|                  | Pulse Jet Fabric Filters (Baghouses)  
|                  | Wet Electrostatic Precipitators  
|                  | Wet Particulate Scrubbers  
| **NOx**          | Selective Catalytic Reduction (SCR) Systems  
|                  | Selective Non-Catalytic Reduction (SNCR) Systems  
| **SO₂/Acid Gases**| Dry Sorbent Injection Systems  
|                  | Spray Dryer Absorbers  
|                  | Wet Scrubbers/ Acid Gas Absorbers: Atomizing Spray Scrubbers  
|                  |                    | Spray, Tray and Packed Towers  
| **H₂S**          | Non-Regenerative Carbon Adsorption  
| **Acid Mists**   | Dry Sorbent Injection Systems  
|                  | Wet Electrostatic Precipitators  
| **Mercury**      | Activated Carbon Injection Systems  
| **Dioxins & Furans** | Activated Carbon Injection Systems  
|                  | Evaporative Gas Cooling and Conditioning Systems  
| **Odor**         | Oxidizers: Regenerative Thermal (RTO)  
|                  |                    | Regenerative Catalytic (RCO)  
|                  |                    | Recuperative Catalytic  
|                  | Adsorption Systems: Non-Regenerative Carbon Adsorption  
|                  |                    | Zeolite  
|                  | Biological Abatement: Bioscrubbers/Bioreactors  
| **Liquid Solvents** | Distillation and Purification: Striping Columns  
|                  |                    | Purification Columns  
|                  |                    | Rectification Columns  
| **Heat Recovery** | Custom Secondary (Air, Glycol, Water, Steam, Oil)  
|                  | Prepackaged, Stand-alone  
|                  | Waste Heat Boilers  
| **Flue Gas Temperature Control** | Evaporative Gas Cooling and Conditioning Systems  
| **Emissions Monitoring** | Continuous Emissions Monitoring Systems (CEMS)  
|                  | Data Acquisition and Handling Systems (DAHS)  

Regenerative carbon adsorption systems
for removal, recovery and purification of solvents from process exhaust air streams

B&W MEGTEC supplies proprietary systems for high efficiency removal, recovery and purification of solvents from process exhaust air streams.

Solvent recovery using carbon adsorption offers an alternative to destruction technologies for VOC emissions control. Solvent recovery is particularly advantageous in applications where the quantity of solvents is large, the value of the solvents is high, or the solvents contain chlorine, bromine, fluorine or nitrogen as no secondary pollutants are produced. B&W MEGTEC solvent recovery systems offer an economical way to reduce emissions and address emissions control requirements.

B&W MEGTEC solvent recovery systems include steam regenerated carbon adsorption, condensation, and packed bed fluid scrubbing systems to remove and recover the solvents from the process stream.

Gas purification is another application of the regenerative adsorption technology. B&W MEGTEC provides systems to remove benzene, toluene and xylenes from acid gas, and also for removing unwanted organics from process exhaust gases upstream of catalysts.

Non-regenerative carbon adsorbers

B&W MEGTEC offers a range of non-regenerative carbon adsorbers suitable for treating low mass emissions of a wide range of pollutants, from volatile organic compounds/hazardous air pollutants/solvents to odors and hydrogen sulfide. Once the carbon is saturated with the contaminants, the carbon is replaced with new carbon.

Non-regenerative carbon adsorbers can provide a low capital cost solution in applications where total annual emissions is less than 10 tons.
Distillation systems for separation and purification of solvents

B&W MEGTEC designs, builds and installs distillation systems to separate and purify solvents for reuse after recovery from the process stream. Solvents can be made suitable for recycle and reuse in a variety of applications, including pharmaceutical and other specialty industries. Continuous or batch processes are available, operating under vacuum or atmospheric pressure, depending on the solvents and purity levels required.

Systems can also be supplied to treat stand-alone purification requirements such as drying of solvents and removing organics from waste water to make the water suitable for disposal.

Systems are generally supplied preassembled on skids for ease of equipment installation, reducing installation time and cost.

Pilot distillation system

Located at the B&W Research Center in Barberton, Ohio, the separations simulator is a bench-scale distillation system available for process development testing of various liquid feed materials to determine the feasibility of purity attainment and to generate data for full-scale commercial design. Testing in a laboratory setting reduces risk and cost by facilitating the investigation of first-of-a-kind concepts and process improvements in a controlled environment.

The system is engineered, maintained, and operated by experienced chemical engineers who collaborate with the end customer to develop test methodologies that allow for collection of meaningful data during the experimental phase. Reported test results can provide insight for further pilot campaigns or production scale-up.

The separations simulator is flexible to suit various configurations and flow schemes.
Spray Dryer Absorbers and Wet Scrubbers

Treatment of industrial process gas streams for the removal of particulate and acid gases

B&W MEGTEC offers spray dryer absorber (SDA) technology for SO\(_x\), HCl and HF removal, with applications in biofuels, incineration, iron and steel, mining and metallurgical, cement and waste-to-energy, to name a few. When integrated with our pulse jet fabric filter and dry sorbent injection (DSI) technologies utilizing powdered activated carbon (PAC) injection, our SDA is part of an integrated approach to high performance particulate, mercury and acid gas emissions control. With dozens of reference plants, our SDA is especially effective in municipal and solid waste incineration, power generation, cement and metals applications.
Our SDAs provide effective control of $SO_x$ and HCl by the injection of calcium, potassium or sodium-based slurries. Unlike wet scrubbers, all water is evaporated, with no liquid waste stream generated. The dry materials often can be recycled back into the system, avoiding the generation of a waste stream.

We offer a variety of proven wet scrubber absorber designs, specifically suited for high efficiency removal of acid gases of high, medium or low concentrations. Open spray tower, packed tower or tray tower designs are available. The goal is optimum emissions reduction and sorbent utilization at affordable pressure drop.

For gas streams containing acid gas and particulate, the Turbotak scrubber controls these contaminants in a single system with minimal pressure drop, low water usage and low maintenance.

We have considerable experience with wet particulate scrubbers for separating relatively coarse particulate from a flue-gas stream at affordable pressure drops. For applications with high particulate loading, the venturi scrubber offers constant pressure drop, which equates to constant removal efficiency. A variety of venturi scrubber designs are available to suit a wide range of applications, including hot or corrosive gases and abrasive or sticky dust.

Our reference plants include many industrial process operations including waste-to-energy, hazardous waste combustion, chemical, mining and metallurgical applications.

To meet stringent requirements for fine particulate, heavy metals and opacity control, these wet particulate scrubbers or acid gas absorbers are often combined with a wet electrostatic precipitator.

We offer pilot equipment rentals and test programs designed to optimize full-scale equipment performance, customized for your specific application.

The pilot plant rental includes a pilot control room, venturi scrubber and separator.
Wet and Dry Electrostatic Precipitators

Electrostatic precipitators for capture of submicron particulate, heavy metals, acid mists and fumes from process gas streams

B&W MEGTEC offers proven, reliable, highly efficient wet and dry electrostatic precipitators (ESPs) for metallurgical, coal, oil and biomass combustion as well as waste incineration applications.

Combined with the experience of Babcock & Wilcox, B&W MEGTEC has more than a century of experience with wet and dry ESPs covering a wide spectrum of applications: steam and power boilers, non-ferrous metallurgical/sulfuric acid plants, organic and inorganic chemicals, petroleum refineries, pulp and paper mills, waste-to-energy applications, and many other industrial manufacturing processes. Wet ESPs are often deployed after wet scrubbers as a polishing filter for high efficiency control of condensable emissions and fine particulates.

With our complete suite of emissions control solutions, we can recommend the optimum locations for dry ESPs as efficient, low pressure drop particle separators, in conjunction with downstream baghouses and wet ESPs or scrubbers for achieving effective multi-pollutant control.
Wet electrostatic precipitators

Wet electrostatic precipitators are a proven polishing filter for the reduction of sulfuric acid mist and fine particulates, condensed metal fumes and organics, especially where a wet solution is preferred for the maximization of condensable particulate capture. Our experience includes wood products and pelletization applications, petrochemical plants, acid regeneration and metallurgical sulfuric acid plants, petroleum refineries and other waste-to-energy applications. We offer all-steel and all-alloy designs with materials chosen based on specific applications. Our rigid discharge electrodes (RDE) are designed based on years of research and commercial experience to match the specific application. Our modular designs are shop fabricated, allowing for easy transport of wet ESP modules.

A mobile gas cleaning pilot system is available for on-site performance demonstrations and data collection. It is designed to analyze outlet emissions at various operating conditions. The wet ESP pilot includes advanced switch mode power supply (SMPS) technology, variable frequency drive and fully automated PLC and HMI controls.

Dry electrostatic precipitators

As a part of the B&W family of companies, B&W MEGTEC is able to bring to industry our OEM experience of hundreds of dry ESP projects covering a diverse range of process applications. Our aftermarket experience includes upgrades and improvements of dry ESPs of various commercial designs. Reliable rapper systems, collector plates and discharge electrodes are designed to provide optimum collection efficiency. And B&W’s SQ-300®/i series automatic voltage controllers (AVC) are some of the fastest reacting power supply controllers in the market today.
Pulse jet fabric filters (baghouses) for cost-effective particulate emissions control

B&W MEGTEC provides cost-effective control of particulate emissions with our proven pulse jet fabric filter technology. B&W provides a strong history of industrial fabric filters dating from the 1930s. Through our innovative technologies, we have provided some of the lowest emission fabric filters in the world for a variety of industries including steel, cement, incineration and steam generating boilers that utilize a variety of fossil and biomass-based fuels.

Our continuing R&D has led to several innovations that have reduced the cost of particulate control solutions. Long bag technology has been in commercial operation for more than ten years, with bags often reaching a length of ten meters. In applications where an existing ESP can no longer meet plant emissions requirements, long bag technology has enabled successful conversion of an existing dry ESP to a pulse jet fabric filter.

Fabric filters for multi-pollutant control

Our focus on providing systems solutions for multi-pollutant control has led to such innovative designs as locating a clean-side SCR for nitrogen oxides (NOX) control after a spray dryer absorber and fabric filter for sulfur dioxide (SO2) and particulate control. This strategy includes both the traditional collection of ash or particulates, as well as hazardous air pollutants (HAPs).

Integrating fabric filters with our sorbent injection and flue gas desulfurization (FGD) technologies also provides low HAP emissions in a variety of applications. Examples of sorbents used with fabric filters include powdered activated carbon for mercury control and trona or lime for control of SO2. Trona or lime may also be the economic choice for SO2 control on certain applications.
Evaporative Gas Cooling and Conditioning Systems

Systems for improvement of baghouse performance, enhanced ESP performance and protection of process and air pollution control equipment

The B&W MEGTEC evaporative gas cooling and conditioning system helps to protect your downstream equipment, enhance air pollution control performance, reduce gas volumes and increase production capacity.

B&W MEGTEC’s Turbotak atomizing nozzles introduce a controlled amount of finely atomized water into the hot gas stream to reduce and/or maintain gas temperature. The water evaporates, while absorbing heat from the gases, for free-flowing dust, zero liquid discharge, and minimal or no wall buildup.

Our proven design has been used in hundreds of installations. Incinerator, kiln or furnace exhaust gases are cooled prior to baghouse filtration, reducing the volume of exhaust gas to be filtered and thereby protecting the baghouse.

The B&W MEGTEC systems condition high resistivity dust particulates (glass, cement, etc.) by raising humidity, enhancing the collection efficiency of baghouses/electrostatic precipitators.

B&W MEGTEC can provide new installations or retrofits and upgrades to existing systems, as well as other components and services such as spray nozzles, controls, pumps and cooling tower fabrication.

Turbotak and SoniCore™ atomizing nozzles

Used in hundreds of industrial applications, Turbotak and SoniCore™ nozzles atomize liquids to fine (5 μm to 60 μm SMD) droplets. The air-atomized nozzles feature a proprietary, two-phase design for superior control of droplet size and spray distribution.

The combination of the small droplets, the distribution pattern and rugged construction make them ideal for a wide variety of applications, including evaporative gas cooling, spray drying, wet and semi-dry scrubbing, performance enhancement of air pollution control systems, dust suppression, as well as combustion and incineration.
When volatile organic compounds (VOCs) exist in a solvent-laden exhaust air stream of a manufacturing process, they are either collected for recovery for potential re-use or they need to be destroyed. When the solvents have little or no recovery value or where there are concerns for disposal of toxic compounds, a destruction technology such as thermal or catalytic oxidation may be the best option.

**Regenerative thermal oxidizers (RTO)**

B&W MEGTEC offers a range of RTO designs and configurations to meet your needs and provide the best solution for your application.

Our designs include a two-chamber, single vessel RTO with a switch valve that keeps cleaned air totally separate from dirty process air.

We offer an economically designed RTO for low air flows that incorporates two individual poppet valves in a two-chamber, single vessel design. The unique, compact system meets the needs of a wide variety of applications while providing efficiency and reliability at an affordable capital investment.

Where a multi-canister oxidizer is required, we offer a modular, highly flexible design for certain applications. With its innovative compact design, the unit features low operating and capital costs with effective VOC destruction.

We also offer a unique, modularly designed single-bed, compact, flameless RTO with low operating costs. The oxidation reactions which purify the process exhaust occur entirely within the heat exchange media. There is no open flame and therefore, none of the unwanted by-products of flame combustion.

Our RTOs are designed for low to high volume air flows with high thermal and VOC destruction efficiencies. In many applications, the system will run in a self-sustaining mode whereby no additional fuel is required to destroy VOCs.

We also accommodate customized application design needs, with extended residence times, gas scrubbers for off-gas clean-up, concentrators, and exotic materials of construction.
Regenerative catalytic oxidizers

Regenerative catalytic oxidizers (RCOs) combine the low operating temperature of catalytic oxidizers with the heat storage and recovery characteristics of a regenerative thermal oxidizer (RTO). This combination provides the lowest operating cost VOC oxidation technology available for applications with low VOC concentrations.

B&W MEGTEC uses its years of experience in catalyst development, application and testing to help you determine if an RCO is the correct equipment for your application.

RTO to RCO retrofit

While your existing RTO system may have been designed for optimum thermal efficiency at the time it was manufactured, new advances in media and catalysts now give us more options for many exhaust streams that lend themselves to catalytic technology. In some cases, by converting from RTO to RCO, our customers can recognize a 50% reduction in fuel usage. Many actually achieve an operating condition (self-sustain) with no additional fuel required for oxidation.

Catalytic recuperative oxidizers

B&W MEGTEC offers catalytic recuperative oxidizers as a solution for certain process industrial applications.

The use of catalysts can reduce the temperature at which chemical reactions occur that convert VOCs into carbon dioxide and water. The result is lower temperature operation which not only reduces operating costs, but also extends the useful life of the equipment. B&W MEGTEC offers flexible designs and field-tested, proprietary catalyst formulations.
Selective catalytic reduction (SCR) for high performance NO\textsubscript{x} control

B&W MEGTEC combines its VOC catalytic oxidation expertise with the deep experience of B&W’s selective catalytic reduction (SCR) technology to provide our industrial customers with a proven and competitive suite of NO\textsubscript{x} control solutions.

High performance SCR systems require thorough blending of ammonia with the NO\textsubscript{x}-laden gas. Our ammonia injection grid and mixing systems deliver the high performance required over the entire load range, simply and robustly, with minimal maintenance requirements.

Our reference plant installations include applications that utilize fossil and biomass fuels, as well as municipal waste. Our experience over more than thirty years has established long lasting relationships with several reputable catalyst suppliers from around the world, and together, we provide considerable process application, catalyst selection, sizing and project execution expertise.

Our vast experience allows us to anticipate and control the potential effects of increased SO\textsubscript{2} production, increased pressure drop, or ammonia slip.

Through our array of SCR reactor and flue design options, we can match our overall system design to the available space on site.
Selective non-catalytic reduction (SNCR) for cost effective NO$_x$ control

We are sensitive to the needs of balancing capital and operating costs with optimum performance and availability. In certain applications, our selective non-catalytic reduction (SNCR) technology can be deployed as a relatively low capital cost solution. Our SNCR technology utilizes custom-designed Turbotak atomizing nozzles to inject ammonia or urea solutions directly into the hot gas to chemically reduce NO$_x$ to nitrogen and water. In applications where site specific performance data is necessary, we can conduct a full-scale demonstration of the effectiveness of an SNCR solution.

B&W MEGTEC offers pilot testing at your facility to determine the feasibility of SNCR for the control of NO$_x$ emissions. Testing can be conducted using urea and ammonia injection to evaluate the best choice of reagent for your process, equipment sizing for full-scale installation and injection location. Equipment provided for performance testing includes injection nozzles, pump skid and controls.

We continue to expand our database in chemical production applications such as glass and carbon black manufacturing through full-scale demonstrations. Our goals are to maximize NO$_x$ control performance while optimizing chemical utilization with low ammonia consumption and the lowest levels of ammonia slip. We utilize both predictive and scale modeling techniques to assure optimum gas flow distribution to achieve this goal.
Dry Sorbent Injection (DSI) Systems

Low cost solution for reduction of acid gas levels

B&W MEGTEC offers dry sorbent injection (DSI) systems in combination with a downstream fabric filter or dry ESP to support a multi-pollutant control strategy. Our experience includes installations in a variety of applications to mitigate emissions such as mercury, dioxins, HCl, HF, SO₂ and SO₃. We have considerable application knowledge to match sorbents with the varying performance and emissions control needs of our customers.
Complete systems, replacement parts and rebuilds

B&W MEGTEC provides original equipment for the Multiclone® dust collector — a simple and efficient multiple tube cyclonic collector. It combines low maintenance, long collecting tube life, reliable operation and a modular design with the versatility for use in a variety of applications.

The Multiclone dust collector uses centrifugal action to efficiently separate dust from a gas stream. It can be used in applications which require a reduction in particulate or used as a pre-cleaner to lighten the dust load on a secondary collector. B&W MEGTEC provides complete systems, replacement parts and component rebuilds.
As a single-source supplier, B&W MEGTEC can provide a complete project, combining design, engineering, procurement, supply and construction into one seamless and integrated project. For our customers, this means single-point accountability and overall project risk reduction.

A key to continued success of B&W MEGTEC is the depth and breadth of our applications engineers and cross-disciplinary teams. Whatever your environmental solution requirement, however complex it may be, our engineers will work to find the right solution — a solution that can be implemented within the constraints of your business goals.

In addition to the functional disciplines of engineering, our team is deep in applications and process knowhow. From distillation systems to gas purification, by adsorption with zeolites or carbon beds, or by wet, dry or semi-dry absorbers for acid gas removal, or with fabric filters or electrostatic precipitators for particulate capture, our staff of engineers possess expertise in a variety of applications.

Our team of thermal air specialists can provide you with a full menu of heat recovery options to ensure that your oxidation systems and production plants are operated in the most energy efficient and cost effective manner possible. Whether your process uses electricity, steam, hot air, or thermal fluids, B&W MEGTEC can integrate the equipment you need to help reduce your operating costs and carbon footprint.

We do not just stop with technology solutions. We help implement them at your plant through our expert project management teams. Our proven experience is demonstrated by the execution of thousands of projects — meeting performance objectives on time and within budget.

We have executed multi-pollutant control driven complex projects in the fossil, biomass, chemical waste, sewage sludge and municipal waste combustion applications.

If solutions require outside technologies or equipment, B&W MEGTEC draws upon a long list of trusted suppliers, integrating these into the B&W MEGTEC total solution with seamless project management.
We have rich process knowledge. You’ll realize the benefits.

B&W MEGTEC’s team of engineers and technical support representatives bring decades of engineering, manufacturing and service experience for your application. Through every phase of the project, from engineering studies, project management, to project installation, we take the time to determine your needs and recommend the solution best suited for your needs. We listen, we work to understand the challenge, and we provide the right long-term solution.

It doesn’t stop at project completion. We are available to supply parts and technical support. We have more than 150 technical service professionals located worldwide. They can help to keep your existing equipment running efficiently by providing equipment upgrades, preventive maintenance, technical support and spare parts.

Supporting our Customers with Aftermarket Services

Upgrades and rebuilds
- Electrostatic precipitator upgrades
- Solvent recovery and distillation system upgrades
- Oxidizer rebuilds
- Control panel and instrumentation upgrades
- Burner/plenum retrofits

Parts and technical support
- Replacement and spare parts
- Technical support representatives

Preventive maintenance services
- Equipment maintenance and upgrades
- Equipment performance optimization
- Operating cost reduction services
- Regulatory compliance assistance

Process and energy optimization services
- Custom secondary heat recovery (air, glycol, water, steam, oil)
- Energy usage analysis and energy cost reduction
- Process energy audits
- Process heating/cooling analysis

Catalyst and carbon testing
- Bead and monolith catalyst retrofits to any catalytic oxidizer
- In-house testing as required by MACT standards

Environmental monitoring and reporting systems
- Continuous emissions monitoring systems (CEMS)
- Data acquisition and handling systems (DAHS)

Thermal air management
- Air flow dampers, burner systems, controls

Turnkey installation services
- Installation supervision and project management services
- Rigging, piping, electrical, and assembly services
- Ductwork fabrication, insulation and installation of ductwork
- Concrete and structural steel work
- Process interface and safety systems