

Precision engineered.



MERCURY



Engineering



Services



Products

Mercury Vacuum Technologies
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Parsippany, NJ 07054



This is Mercury Vacuum Technologies.

Setting a new standard of measure in vacuum performance.

Our Mission

Our mission at Mercury Vacuum Technologies is to collaborate with our clients and suppliers to deliver vacuum systems and engineering services of uncompromising Quality while building on the foundations of trusting relationships and engineered value. Through dedication to our core values of Safety, Quality, Innovation, and Integrity, it is our aim to provide an unparalleled experience for our clients and suppliers as well as our employees.

Our Commitment to Quality

At Mercury our commitment to total Quality is the standard at every level of design, manufacture, and service. Mercury is proud to design and manufacture vacuum equipment in strict accordance with internationally recognized codes and standards including HEI, ASME, and TEMA as well as others. Our Quality Assurance program is fully compliant with **ISO 9001** and **ASME NQA-1**.



Product Design

It starts with designs that are custom engineered for the specific type of power plant and consideration for the special requirements of that plant. For example, a combined cycle plant is often required to be ready for start-up on very short notice, operate at partial loads depending on grid demand, and be flexible to respond to the demand at any time during the day or night. The condenser air removal system must be designed to meet these requirements; to be able to allow the condenser to operate on its thermal curve wherever the turbine load requires it to function.

There is no standard vacuum system design that will handle all of these requirements. The era of the "one size fits all" vacuum system of 50 years ago for base load thermal plants is long over!



Mercury engineers have designed and installed vacuum systems in power plants worldwide ranging from 500 KW to 1200 MW output.



Quality Components

At Mercury we are committed to uncompromised Quality throughout our product offering. ALL our sub-components, from heavy duty motors to instrumentation, are manufactured by well-known suppliers in the power industry. We name them in our proposals, with pride. All of our welded fabrications are done to well-known and required industry standards including ASME, ANSI, ASTM, TEMA, AWS, etc. and verified through our Quality Assurance Program in compliance with **ISO 9001 & ASME NQA-1**.



POWER MARKET SEGMENTS



Combined Cycle

Key design challenges include frequent start-stop cycles, partial load operating conditions, and extreme daily and seasonal variations. Mercury vacuum systems are designed to meet these requirements so that steam turbine output is optimized across the entire operating range.



Solar Power

Solar plants require vacuum systems to be designed for closed-cycle cooling water systems and daily start-stop cycles. Designing the vacuum system for optimum condenser/turbine performance is critical for meeting plant output criteria.



Biomass & Waste to Energy

Biomass plants impose extreme operating requirements for the vacuum system due to very wide turbine operating criteria, which depends on the amount of steam exported and balance remaining for power generation. Mercury offers a wide range of options to optimize the vacuum system for each specific plant's operating requirements.



POWER MARKET SEGMENTS



Coal Fired

Mercury provides rugged, quality ejector and vacuum pump systems for the demanding requirements of 24/7 base load coal-fired power plants. Reliable, long term operation with minimal operator and maintenance attention is critical to obtaining maximum power output and heat rate requirements.



Geothermal

MVT offers ejector and ejector/vacuum pump hybrid systems optimized for specific steam field conditions with minimal parasitic utility requirements designed to maximize steam turbine output.



Nuclear

Base load nuclear plants require efficient, rugged vacuum pump systems designed for 24/7 operating conditions. MVT exhausters are designed for 100% remote operation and close monitoring of system operation for today's modern nuclear plant requirements.



EJECTOR VACUUM SYSTEMS

A typical modern Ejector Air Removal System is a custom designed unit consisting of the following:

- Two 100% 1st Stage Ejectors
- Intercondenser (100% or 200%)
- Two 100% 2nd Stage Ejectors
- Aftercondenser (100% or 200%)
- 100% Capacity Hogger Ejector
- Hogger Silencer
- Valves, Instrumentation, & Piping

All packaged for "Plug-and-Play" installation at the plant site.

Mercury Vacuum Systems are designed in full accordance with HEI venting system capacities and all applicable customers utility and mechanical specification requirements.

Key Features

- Entire range of condensate flows accommodated with no external bypass needed.
- ASME Section VIII designed and stamped ejectors & condensers.
- All welded piping designed and constructed to power plant piping code ASME B31.1.
- All fabrications inspected 100% VT as a minimum to ASME and AWS weld acceptance criteria by certified weld inspectors (CWI).



Mercury Ejector Air Removal Systems are designed to meet high standard requirements, with wide range dry air performance at the design capacity criteria for the plant, insuring that the system will have full HEI® venting capacity at all points on the condenser thermal curve, with consideration for wide ranging condensate flows and temperatures. This design philosophy is especially important for the venting requirements of air-cooled main condensers.

The customer is assured of a premier Quality vacuum system built to last for the life of the power plant. We back up our products with an industry leading 3-Year Standard Warranty.



LIQUID RING VACUUM PUMPS

Key Features

- Designed to meet HEI venting system requirements for full range of capacities.
- Fully automatic operation in both hogging and holding modes.
- Integrated instrument suite for remote monitoring and diagnostics in real time.
- Designed thermally to avoid cavitation at any point on the main condenser operating curves.
- Comprehensive factory acceptance testing (F.A.T.) including HEI performance, vibration, noise, and precision drive train alignment.

Using Liquid Ring Vacuum Pumps for condenser air removal is not just another application when it comes to pump sizing and system design. Requirements such as frequent start/stop operation, wide ranging inlet conditions and cooling water temperatures, frequent low absolute pressure operation with cavitation potential, combined with very high reliability and low maintenance needs impose demands on a pump system design that few in the liquid ring world can appreciate.

Mercury Exhausters are designed for the real world of today's power plant requirements.



WATER BOX PRIMING SYSTEMS

Power plants that use natural water sources for cooling often require the main condenser water boxes to be primed to reduce circ. water pump horsepower and to remove air that comes out of solution as the water heats up going through the tubes. This air tends to accumulate at the top of the water boxes with negative consequences to condenser performance.

A typical Water Box Priming System consists of two Liquid Ring Vacuum Pumps mounted on a vacuum control tank which serves to modulate cycling of the pumps during continuous air removal duty. Both pumps are sized to prime the condenser tube side and lift circ. water to the top of the water boxes before the circ. water pumps are started. Once initial prime is obtained the system automatically goes into normal service where vacuum in the control tank is maintained by alternating pump operation as air is continuously removed from the top of the water boxes. Priming valves mounted at the top of each water box vent air while preventing circ. water from getting into the priming system. MVT offers a complete line of tank mounted duplex Water Box Priming Systems designed for typical modern combined cycle condenser installations.

We provide custom designed systems for larger condensers and unusual installation requirements. Each system is complete with automatic controls for local and/or remote operation. We also provide priming valves (suitable for seawater service) and all required accessories. Options are available for air cooling where a convenient source of cooling water is not available and complete control systems with motor starters for remote installation locations.



Mercury offers a complete line of tank mounted duplex Water Box Priming Systems designed for typical modern combined cycle condenser installations.



Key Features

- Systems available for any main condenser priming requirement.
- Rugged designs suitable for raw water and seawater service
- Plug-and-play installation with full auto control & DCS start-stop.
- Custom priming valve assemblies designed to match a large range of water box priming capacities.
- Custom configurations including air-cooled heat exchangers for remote installations.



HYBRID AIR REMOVAL SYSTEMS

ACC Air Jet Hybrids

Due to the relatively large volume associated with ACC main condensers large pumps are commonly used for hogging duty. This available pump capacity can be used to provide the motive air for an air ejector to extend the pumps' ability to do holding duty as well. One pump can therefore be utilized for holding duty with no motive steam required for a very modest increase in initial capital cost. These systems utilize closed cycle cooling water and are designed for plug-and-play installation in the field.

A true hybrid Air Removal System consists of a first stage ejector, an intercondenser, and a liquid ring vacuum pump (typically two stage) on the same skid. The pump does hogging duty and operates as the final stage of the system during holding operation. The ejector serves as a booster for the pump increasing the inlet pressure so that the pump will never operate at or near cavitation conditions.

This design takes advantage of the operating characteristics of both components in a compact, cost-effective package. Key advantages of this concept are low steam usage, modest parasitic pump power requirements (compared to vacuum pump exhausters), the ability to use closed cycle cooling water for the pump(s), and fully automatic operation consistent with the demands of today's modern power plants.



CONDENSATE PUMP SYSTEMS



Mercury offers a complete line of custom designed condensate pump systems in duplex, triplex, and quadruplex configurations to meet the plant's requirements. Working closely with a select few pump suppliers we design a system that will work automatically to maintain proper level in the hotwell under varying load conditions. These are "plug & play" packages that include isolation valves, non-return valves, vibration isolators, by-pass control valves (as required), manifolds, and instrumentation for a complete, engineered solution. Options include control panels with logics, motor starters, and level control instrumentation for remote monitoring and control.



MANUFACTURING

Mercury vacuum systems are fabricated and assembled by a select team of manufacturing partners in the U.S. Working with our partners we ensure that our design philosophy of quality components and quality procedures are incorporated into every system shipped to the customer. Every detail including system components, welding and fabrication, assembly and testing, and Quality Assurance is carefully engineered and specified by Mercury to meet the stringent demands of the Power Industry today. All welded fabrications are done in the U.S. with strict adherence to industry standard Codes of design and construction. All system assemblies are completed in shops with over 80 years of combined experience in Liquid Ring and Steam Ejector Vacuum System manufacturing. All work is done per MVT drawings, specifications, Quality Control, and engineering supervision. Testing is conducted and certified by Mercury factory trained engineers.

CAPABILITIES

Code Qualified Fabrications



U.S. Assembly & Testing



Power Industry Certifications



Trusted Shop Experience



SERVICES



Consulting Services

With over 50 years combined experience in power plant vacuum system design, Mercury can offer expert consulting services in vacuum engineering and project specifications development.

Site Technical Services

Experienced engineers are available for on-site service needs such as installation inspection, start-up supervision, operator training, and warranty support.



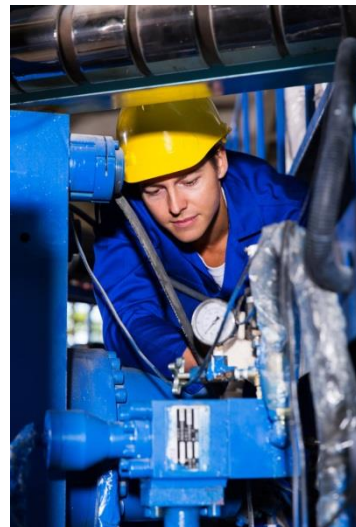
Warranty Support

The customer is assured of a premier quality vacuum system built to last for the life of the power plant. We back up our products with an industry leading **3-Year Standard Warranty**.



Factory Services

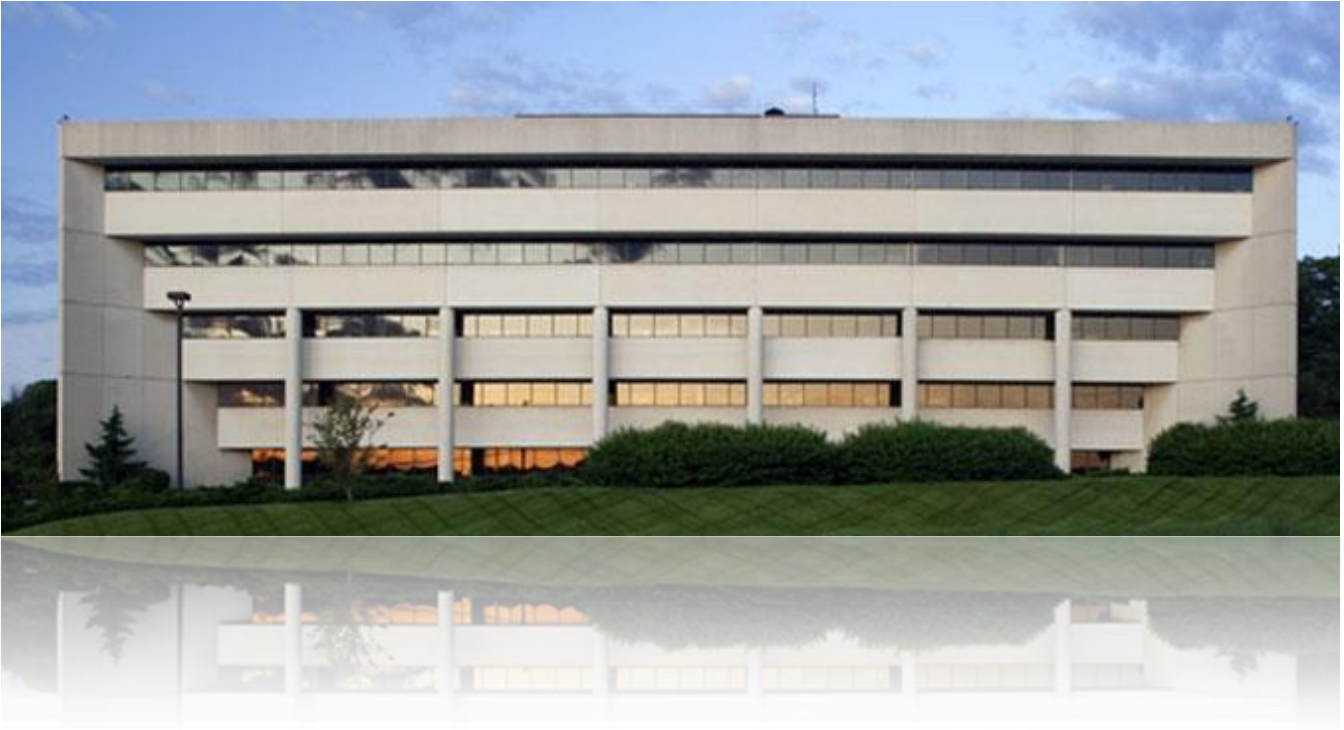
We provide on-site service and support by qualified engineers when required. This includes installation inspection, start-up assistance, existing vacuum system surveys, diagnostics and troubleshooting.



***Mercury Vacuum Technologies –
Setting a new standard of measure in vacuum performance & service.***



CONTACT US



If you have a technical question, a sales inquiry, or would just like to learn more about our product line and capabilities please contact us via e-mail or feel free to call our offices directly.

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