

EVAPCO DRY COOLING

Specialists in Air Cooled Condensers
and Air Cooled Heat Exchangers



Dry Cooling Technology





EVAPCO for LIFE

EVAPCO is more than a name. We are a global innovator in heat transfer solutions for the commercial HVAC, power, industrial refrigeration and industrial process markets. We pledge to make everyday life easier, more comfortable, more reliable and more sustainable for people everywhere.

WHO WE ARE

EVAPCO Dry Cooling, Inc. is a subsidiary of EVAPCO, Inc. specializing in the manufacturing of air cooled heat transfer products. With a keen focus on research and development, EVAPCO Dry Cooling is a world-class ACC manufacturer that continues to drive the industry to the highest standards. With this focus, EVAPCO Dry Cooling offers both traditional A-Frame ACCs as well as the newly introduced state-of-the-art **Advanced Technology™ ACC** that features the **nuCore™** heat exchanger.

WHAT WE DO

EVAPCO Dry Cooling specializes in the design and supply of ACCs and ACHes for the power industry. EVAPCO Dry Cooling has over 5000 MW of operating references in the United States and is considered a premier ACC supplier for the global power market.

EVAPCO Dry Cooling also serves the Power Industry with EVAPCO's eco-Air™ air cooled heat exchangers which are manufactured in EVAPCO's cutting-edge manufacturing facilities in Taneytown, Maryland and in Greenup, Illinois.

With a 100% US-based execution team and experience supplying ACCs and ACHes globally, EVAPCO Dry Cooling has the knowledge of designing to the codes and regulations of any region in the world.

RESEARCH & DEVELOPMENT

EVAPCO's Wilson E. Bradley Research & Development Center has 10 test laboratories including eight environmental chambers, a sound test pad, and a water analytical lab. These facilities provide EVAPCO dedicated R&D space to produce industry-leading products in real-world conditions.

EVAPCO's laboratory is the only laboratory in the world with the capabilities to test full-size ACC heat exchangers with steam under vacuum in a controlled environment. This provides EVAPCO the unique advantage to optimize the ACC design with unprecedented precision and to fully understand phenomena such as freezing, air in-leakage, impingement, flow accelerated corrosion (FAC), steam and air side pressure losses.

The latest addition to the Wilson E. Bradley Research & Development Center is the **Advanced Technology™ ACC** test cell. This test cell is a one-quarter-scale ACC cell utilizing EVAPCO's **nuCore™** heat exchangers which are installed in the same configuration as they would be in an operating power plant.

PROVEN TECHNOLOGY

The EVAPCO Dry Cooling single row finned tubes are installed and operating in more than 45 power plants with a combined electrical generation capacity of over 20GW. Installed in the majority of ACCs worldwide, this fin/tube technology is proven and has developed into the industry standard today. EVAPCO Dry Cooling will continue with this standard of reliability and high thermal performance with the introduction of our new **nuCore™** heat exchanger technology.



Introducing the Advanced Technology™ ACC

The Advanced Technology™ ACC featuring **nuCore™ Heat Exchanger** tube bundles provides two important benefits that make it the new standard in air-cooled condensing:

- Superior Thermal Performance
- Significant Installation Cost Savings

The Advanced Technology™ ACC was engineered with three primary objectives:

- To reduce the amount of jobsite labor required
- To improve safety for site erection
- To reduce cost with improved heat transfer

Features and advantages of the **nuCore™ Heat Exchanger** include:

- Improved heat transfer
- Reduced fouling potential
- Improved freeze resistance
- Reduced sub-cooling
- Factory welded headers

Shop QA/QC is more accurate, easier, and results in fewer leaks; reducing the need for field welding and/or troubleshooting.



The AT-ACC is designed for **modular construction** to provide the following cost saving benefits:

- Factory preassembly reduces the number of parts to erect
- Individual cells preassembled at grade
- Improved labor efficiency
- Reduced overall site erection time

Features and advantages of **AT-ACC** induced draft technology include:

- The lowest overall height in the market
Provides less visual impact, while requiring less reach for cranes and maintenance crews during installation & servicing.
- Fans located above the heat exchanger module
Lowers potential for warm air recirculation and fan vibrations during high winds; improves thermal performance during windy conditions
- Plenum section between fan and heat exchangers
Encourages mature air flow across the heat exchanger's surface and lowers freezing risk.
- Steam fed from underneath
Ideal for modular concepts with reduced subcooling and ducting materials; allows condensate to travel down the steam ducting, reducing the need for additional piping.
- Duct & mechanical equipment designed to be thermally and dynamically independent
Ensures that stresses seen from fan vibrations are not transposed onto duct/heat exchangers; allows for free thermal expansion since the heat exchangers are also thermally independent.
- Heat exchangers supported independently from support structure
Provides freedom of movement due to thermal expansion; minimizes stress points on heat exchangers; simplifies installation with one nozzle connection per HX.





EVAPCO's modular **Advanced Technology™ ACC** allows for the maximum level of modularization seen on ACCs as a standard offering. The **nuCore™ Heat Exchanger** is the most efficient heat exchanger in the industry. This heat exchanger is provided with factory installed headers and allows for a modularized ACC without sacrificing on the overall size of the ACC required for a given heat duty. The synergies achieved combining the **Advanced Technology™ ACC** modularization and the **nuCore™ Heat Exchangers'** high efficiencies result in the most economic solution on the market.



During installation, modules can be assembled offsite and transported by barge (when water access to site is available), or near grade onsite adjacent to supporting structure allowing for the safest industry practices by reducing work at elevation.



eco-Air™ Air Cooled Heat Exchangers (ACHEs)

EVAPCO now has the capability to supply all air-cooled heat transfer equipment required for heavy industry. Often, due to site constraints, when an air cooled steam condenser is required for the steam cycle, an air cooled heat exchanger is also required for auxiliary cooling.

Available fully dry, or with two air pre-cooling options (pads or spray), these modular Air Cooled Heat Exchangers (ACHEs) arrive to the site fully assembled on a flat bed truck or containerized ready to be lifted into place at grade level or raised on a support structure. The robust 304L coils provide a reliable and durable solution for any heavy industrial application.

Maximize heat rejection with minimal or no water usage and experience unparalleled flexibility with a wide range of capacities, footprints, motor types, and control options. Current ACHE configurations include:



V-COIL

Optimized coil angle for heat rejection and air flow; compact plan area & layout



FLAT

Low profile design; great for elevated installations with bottom airflow clearance



DOUBLE STACK

Maximum surface area per footprint; increase capacity; reduce overall number of units



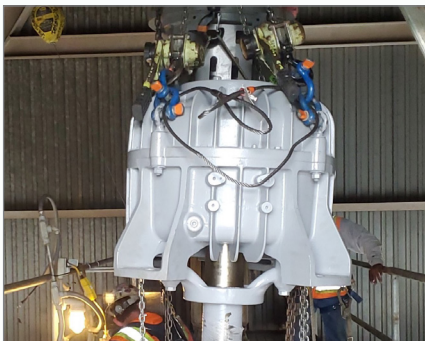
Aftermarket Services

EVAPCO Dry Cooling is the industry leader for aftermarket ACC service and support. From spare parts inquiries, to full-service maintenance agreements, EVAPCO Dry Cooling can support any size operator with a level of service that fits their organization.

EVAPCO Dry Cooling has industry experts on staff and works with innovative equipment suppliers to engineer options to optimize ACC performance and reliability.

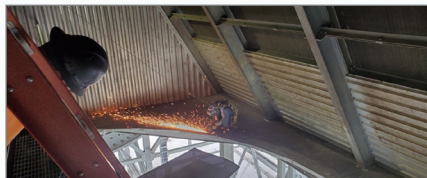
DRY WELL GEARBOXES

- Guaranteed leak free
- Lower cost than OEM replacements/refurbishments
- Strong installed references



AIRFLOW & FAN PERFORMANCE IMPROVEMENTS

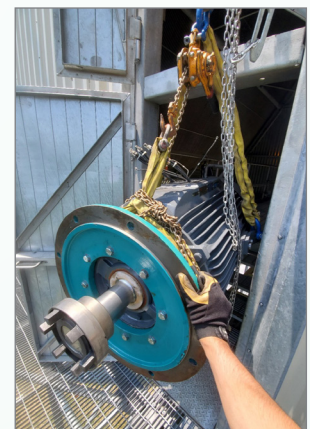
- Optimization of existing fan installations
- Replacements with advanced blade profiles to:
 1. Increase efficiency
 2. Improve reliability
 3. Focus on quality manufacturing
 4. Provide fast lead times



EVAPCO Dry Cooling has experienced field engineers and employs highly trained laborers from across the country to perform ACC maintenance. Take comfort that the crews maintaining your ACC know what to look for and how to properly care for FRP & aluminum fan blades, gearboxes, and other vital ACC equipment.

FIELD SERVICES INCLUDE:

- Fan blade manufacturer required maintenance:
 1. Bolt torque verifications
 2. Blade integrity inspections
- ACC preventative maintenance schedule:
 1. Flow accelerated corrosion monitoring
 2. Gearboxes & motors (vibration, oil analysis, oil changes)
 3. Vacuum system maintenance & troubleshooting
 4. Drain & condensate pump maintenance
 5. Rupture disk inspection
 6. Thermal performance testing & modeling



SPARE PARTS

- Using OEM buying power to provide spares at lower costs than going direct to manufacturers
- Excellent service with a single point of contact
- Spare part supply & installation services available

EVAPCO Dry Cooling is a global supplier of new ACCs and can leverage these strong working relationships with OEM suppliers of fans, gearboxes, motors, vacuum systems, and more to provide the most competitive pricing on spare equipment, refurbishments, or parts. Allow us to provide a hassle-free quote for your next project.



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