INDUSTRIAL REFRIGERATION CONDENSERS

Total Condenser Product Overview **Evaporative, Hybrid, Adiabatic & Dry**





GLOBAL COLD CHAIN ALLIANCE®



AIT-Conditioning, Heating, and Refrigeration Institute





Get to Know EVAPCO

- The global innovator in heat transfer solutions
- Serving the commercial HVAC, Industrial Refrigeration, Power Generation, and Industrial Processing markets
- Founded in 1976
- Employee-owned
- 26 engineering & manufacturing facilities in 10 countries
- More than 170 sales offices worldwide

Learn More Now

Visit evapco.com to download product catalogs, view complete product specifications, and more.

EVAPCO is more than a name.

It's a pledge to make everyday life easier, more comfortable, more reliable, and more sustainable for people everywhere. How do we fulfill that promise? It's simple.

We never stop innovating.

At EVAPCO, we don't just talk about innovation, it's ingrained in our workflow. Guided by our annually developed R&D plans, we set out to find groundbreaking solutions that transform the way the world works for the better. It's why we have more than 78 active patents.

We craft exceptionally built solutions.

As an employee-owned company, we take pride in our work. We are proud to be one of the most experienced teams of engineers and craftsmen in the industry. This translates into solutions that are always exceptionally built. EVAPCO has an unwavering commitment to provide "best in class" heat transfer solutions and services.

We guarantee performance.

Every EVAPCO solution is put through rigorous research and testing to ensure maximum efficiency and reliability. But we don't stop there. EVAPCO is an industry leader in independent, third-party performance certifications. These certifications guarantee our performance metrics—so that you can plan your projects with complete peace of mind.

We protect the environment.

Innovation and environmental sustainability go hand-in-hand at EVAPCO. Our industrial heat transfer equipment not only conserves natural resources and helps reduce noise pollution, but also features recycled steel content in construction. EVAPCO's stainless steel units are constructed of panels that contain up to 67% of recycled content, and our galvanized units contain over 79%. From sound reduction to water conservation to chemical elimination, we are continuously developing new technologies that deliver the ultimate operating advantages to our clients—while protecting the planet for every generation to come.



Full Spectrum Global Solutions



EVAPCO's wide array of industrial refrigeration condenser products ensure we have the optimum solution to meet all applications. EVAPCO condensers can be selected to reduce energy consumption, minimize or eliminate water usage, or a combination of the two. Utilizing EVAPCO's Spectrum[™] selection software, the optimum condenser can be selected to meet the design goals of any project. Contact your local EVAPCO Representative for assistance in selecting the unit that best fits your application.

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ATC-E

The industry's original induced draft condenser, providing high efficiency with unparalleled flexibility for your layout requirements.



- Sloped basin design prevents sediment buildup, biological film and standing water.
- Panel Construction as standard.
- Available in both 304 and 316 Stainless Steel Panel Construction.
- Keeps water in while keeping dirt and debris out.

The ATC-E line of induced draft evaporative condensers reflects EVAPCO's continuing commitment to research and development. The advanced design provides owners with many operational and performance advantages. The owner-oriented features of the ATC-E, along with the independent certification of IBC compliance, reinforce the ATC's position as the premier induced draft evaporative condenser for the industrial refrigeration industry. The ATC-E condenser is available in box sizes ranging from 4' x 6' to 24' x 40' and capacities from 35 to 2,637 Ammonia Tons.

eco-ATC-A

All the benefits of the ATC-E but with increased wet capacity and much improved dry capacity thanks to EVAPCO's Ellipti-*fin*[®] extended surface heat transfer coil, resulting in energy and water savings.



The **eco-ATC-A** line of induced draft evaporative condensers includes many of the advanced ATC-E features while utilizing the Ellipti–*fin*[®] extended service heat transfer coil. The eco-ATC-A offers improved heat transfer during wet operation and offers significant water savings due to extended periods of dry operation. With high dry bulb switchover temperatures, dry operation near or above freezing are easily accomplished making it an ideal solution for cold climates. The eco-ATC-A condenser is available in box sizes ranging from 4' x 6' to 24' x 40' and capacities from 87 to 2,728 Ammonia Tons.

eco-ATC-H

The eco-ATC-H Hybrid condenser, utilizing EVAPCO's Ellipti–*fin*[®] evaporative coils and ARID *fin Pak*[™] dry condenser coils, yields the highest dry bulb switchover temperatures in the industry, yielding impressive water savings over traditional evaporative condensers.



The **eco-ATC-H** Hybrid line of induced evaporative condenser feature EVAPCO's Ellipti–*fin*[®] extended surface coil and ARID *fin Pak*[™] dry coil. This combination offers high wet capacity and much improved dry capacity allowing for more dry operating hours and water savings. For installations where water savings and plan area are both important design considerations, the eco-ATC-H provides the optimal solution.

PHC-E

EVAPCO's Parallel Hybrid Condenser combines EVAPCO's industry leading evaporator coil and cooling fill technology, resulting in smaller coils and reduced refrigerant charge while providing layout flexibility and maximum capacity per plan area.



• Internal walkway for safe and easy basin access.

The **PHC-E** line of induced draft evaporative condensers reflect EVAPCO's commitment to product development. The advanced design provides owners with many operational and performance advantages. These parallel-flow hybrid condensers are designed for easy maintenance and long, trouble-free operation. With smaller coil volumes, the PHC-E provides reduced operating refrigerant charge. Multiple units can be in installed in such a fashion to maximize capacity per plan area. PHC-E condensers are available in capacities from 84 to 2,120 Ammonia Tons.

PMC-E

EVAPCO's forced draft axial fan condenser, the PMC-E, boasts multiple ground level fan motors offering redundancy, increased reliability and easy maintenance access.



- Easy motor replacement.
- Front-mounted drives for improved maintenance accessibility.

The industry standard forced draft axial fan condensers for a reason. The **PMC-E** is equipped with many features and benefits that make it *Easy to install...Easy to maintain...Easy on the operating budget...The Easy Choice!* The PMC-E condensers are available in capacities ranging from 124 to 1,432 Ammonia Tons.

eco-PMC

All the benefits of the PMC-E but with increased wet capacity and much improved dry capacity thanks to EVAPCO's Ellipti-fin[®] extended surface heat transfer coil, resulting in energy and water savings.



Individual Fan Drive System

- Increased flexibility for improved capacity control.
- Greater reliability through redundancy.
- Easy motor replacement.
- Front-mounted drives for improved maintenance accessibility.

Sloped Pan Bottom

- Pan bottom slopes to drain.
- Easy to clean.
- Stainless steel strainer resists corrosion.

The eco-PMC line of forced draft, axial fan evaporative condensers include many of the PMC-E features while utilizing the Ellipti-fin® extended service heat transfer coil. The eco-PMC offers improved heat transfer during wet operation and offers significant water savings due to extended periods of dry operation. With high dry bulb switchover temperatures, dry operation near or above freezing are easily accomplished making it an ideal solution for cold climates. The eco-PMC condensers are available in capacities from 130 to 1,554 Ammonia Tons.

LSC-E & LRC

EVAPCO's forced draft, centrifugal evaporative condensers, the LSC-E and LRC, are suited for low noise applications or ducted applications, whether indoor or outdoor. Additionally, the LRC has been optimized and designed for applications where unit height is paramount.



- Assures long life.
- All normal maintenance can be performed quickly from outside the unit.
- If required, motor may be easily removed.
- One piece fan shaft no oil lubrication.
- Motors located outboard on multi-cell units for easier drive system access.

The **LSC-E** and **LRC** units are a result of EVAPCO's extensive experience in forced draft centrifugal fan design. Models in the LRC line are reduced height units for applications with limited height. Both product lines are suitable for ducted installations; and are designed for easy maintenance, and long, trouble free operation. These units are constructed to be IBC compliant.

eco-Air Adiabatic Pad & Spray

The eco-Air Series of adiabatic air-cooled condensers offers maximum water savings, while maintaining similar condensing temperatures as a system using evaporative condensers.



- G-235 galvanized steel available (Pad System Adiabatic Models only).
- ASME B31.5 compliant with design pressure of 350 psig (optional 550 psig).

The **eco-Air Series** of Adiabatic air-cooled condensers represents EVAPCO's newest advancement in thermal heat transfer research and development. Available with Adiabatic Pads or Spray Assist, these eco-Air units maximize heat rejection with maximum water savings. With the minimal water usage, condensing temperature during peak load and ambient conditions are greatly reduced over an aircooled condenser, providing peak system efficiencies close to that of a system using an evaporative condenser.

eco-Air Air-Cooled

For applications where cooling water is not available, highly regulated, or is cost prohibitive, the eco-Air Series air-cooled condenser fits the bill.

Fan Motor Options:

Advanced Motor Technology - Electronically Commutated (EC) or NEMA fan motor designs



The **eco-Air Series** is a robust, industrial design that is 100% fully rated and backed by EVAPCO's Performance Guarantee. The eco-Air Series offer unparalleled flexibility in a wide range of capacities, footprints, motor types and control options.

Optional Equipment

Electric Heaters

Electric immersion heaters are available factory installed in the basin of the condenser. They are sized to maintain a $\pm 40^{\circ}$ F pan water temperature with the fans off and an ambient air temperature of 0°F, -20° F or -40° F. They are furnished with a thermostat to cycle the heater on when required and a low water protection device to prevent the heater elements from energizing unless they are completely

submerged. All components are in weather proof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.



Self Supporting Service Platforms

Condensers are available with self-supporting service platforms that include access ladders which are designed for

easy field installation. This option offers significant savings in comparison to field constructed, externally supported catwalks. The EVAPCO service platform option is located at each maintenance access door.



eco-ATC-A Condenser with Optional Service Platform and Motor Davit

Motor Davit

In the event that a fan motor should need to be replaced, a lightweight motor davit is available from which a chain fall can be mounted to easily lower the motor to the ground.

Internal Platform on Eco-Air

Certain eco-Air models are available with an internal platform for service and maintenance of the motors.



Fully Welded Stainless Steel Basin

Most condenser models are available with an inexpensive all stainless steel basin section. This provides superior corrosion resistance over other materials of construction.

Super-Low Sound Fan

EVAPCO's Super Low Sound Fan utilizes an extremely wide chord blade design and is ideal for low energy, sound sensitive installations without sacrificing thermal performance. This revolutionary technology is

one-piece molded, heavy duty fiberglass reinforced polyester hub and blade construction utilizing a forward swept blade design. The Super Low Sound Fan is capable of reducing the unit sound pressure levels 9 dB(A) to 15 dB(A) depending on specific unit selection and measurement location.





Electric Water Level Control

Evaporative condensers may be ordered with an electric water level control in lieu of the standard mechanical float and make-up assembly. This package provides accurate control of water levels and does not require field adjustment.

TITAN Coils-Stainless Steel Construction

EVAPCO offers the options of Type 304L or Type 316L stainless steel construction using the Thermal Pak® II coil design. Highly efficient heat transfer coils with the ultimate corrosion protection.



Optional Water Treatment Solutions



Pulse~Pure® is an environmentally sensitive nonchemical water

treatment system for evaporative condensers. Developed by EVAPCO, **Pulse**~*Pure*[®] offers an alternative to chemical water treatment programs. Utilizing pulse-power technology **Pulse**~*Pure*[®] provides chemical-free treatment that is environmentally safe.



Smart Shield[®] Solid Chemistry Water Treatment System



EVAPCO's Smart Shield® solid chemistry water treatment system is an innovative solution to conventional liquid chemical programs. Smart Shield®

was developed specifically for evaporative condensers and closed circuit coolers. The system comes factory mounted and includes all the components required for an effective water treatment system. Solid products eliminate the potential for liquid spills making it easier and safer to use. Controlled release chemistry provides uniform treatment over a 30 day period.





Pass-Protect[®] The Superior Passivation Solution

Pass-Protect is EVAPCO's new patented passivation solution. Pass-Protect® is a two step

process that starts in the factory and ends in the field. Step one we call Passiv-Assist[®], a factory applied spray treatment. After a new coil is hot-dipped galvanized, EVAPCO applies a proprietary chemical pretreatment which substantially reduces the potential for subsequent white rust formation. However, the factory pretreatment does not provide a completely passivated coil but it will make field passivation faster and yield better results. The site-specific field passivation service includes EVAPCO inhibitor chemistry, feed and control equipment and routine service visits by a local Water Treatment Partner. The entire process usually lasts between 4-8 weeks whereas other properly executed field passivations can take up to 8-12 weeks or require white rust inhibitor to be fed throughout the life of the evaporative cooling equipment. This reduction in time, along with the ability to passivate under immediate heat load makes Pass-Protect® a game changer in both day one and down the road benefits.



FEATURING PASSIV-ASSIST®

A Condenser to Fit Your Needs

With EVAPCO's Full Spectrum of Industrial Refrigerant Condensers, an optimum solution is available for all installations. Using the Water Energy Analysis tool from EVAPCO's Spectrum Selection Software, condenser energy and water consumption can be evaluated for various load profiles. Below is an example of a 7,500 MBH condenser application at a meat processing facility near Witchita, KS comparing various condensing solutions.



Weather Station: For Wichita, KS, the selected weather station is McConnell AFB

The Temperature Profile generated to estimate water and energy usage is based on 5 year weather data from the National Climatic Data Center (NCDC). The weather data shown above was collected from McCONNELL AFB, USA

For more information visit: http://www.ncdc.noaa.gov/oa/ncdc.html

Load Profile: Meat Processing



Meat Processing Profile Provided Courtesy of Cascade Energy

Cycles of Concentration: Historical water analysis for Wichita,				
KS is on average 4 cycles				
Profile Days:				
Potable Water Cost for Wichita: Estimated at .0028 \$/gal				
Waste Water Treatment Costs for Wichita: Estimated at .0031 \$/gal				
Power Costs:				

Water and Energy Selected Weather St Condensing Temper Wet Bulb Temperatu Refrigerant: NH3	ation: McConnell AFB ature: 95°F	Load Profile: Beef Week Days: 5 Weekend Days: 2 Cycle of Concentration: 4		
	Traditional Evaporative Condenser	Extended Surface Evaporative Condenser	Hybrid Condenser	Air-Cooled with Adiabatic Pads
Model Number:	ATC-791E	eco-ATC-761A	eco-ATC-H 12-2K24-U34	EAVCA-9120ZA320P7- 625AUSP04
Quantity:	1.00	1.00	1.00	2.00
Total Estimated Water Usage per year (gal.)	4,616,650	4,008,150	3,360,490	2,069,780
Total Estimated Water Cost per year (USD)	16,490	14,320	12,000	7,400
Total Estimated Energy Usage per year (kWh)	92,780	87,490	58,310	68,200
Total Estimated Energy Cost per year (USD)	5,910	5,570	3,720	4,350



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