

INDUSTRIAL REFRIGERATION CONDENSERS

Total Condenser Product Overview

Evaporative, Hybrid, Adiabatic & Dry



IARW International Association of Refrigerated Warehouses

Member of
IIAR
International Institute of Ammonia Refrigeration
www.iiar.org

AHRI Air-Conditioning, Heating, and Refrigeration Institute



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 75% of recycled content, and our galvanized units contain over 80%. 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.

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

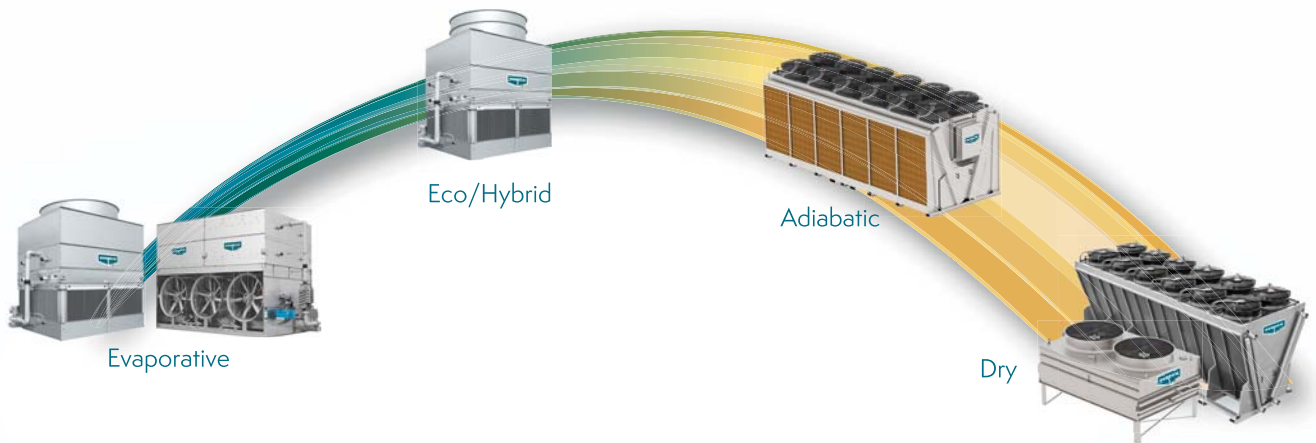
Learn More Now

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



Full Spectrum Global Solutions

EVAPCO offers the full spectrum of condenser solutions from fully evaporative to fully dry.



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.

Smart Shield® Solid Chemistry Water Treatment System



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



ATC-E

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

Thermal-Pak® II Heat Transfer Technology

- High heat transfer efficiency due to tube geometry and orientation.
- Lower refrigerant charge.
- Optional TITAN 304L or 316L Stainless Steel Coil.
- ASME B31.5 compliant with design of 300 psig/2.07 MPa (optional 400 psig/2.76 MPa).

Fan Options

- Aluminum Low-Sound Fan.
- Wide Cord Super Low Sound Fan.
- Up to 15 dB(A) sound reduction @ 50 ft (15m).

Drive System

- Totally Enclosed Fan Motors assures Long Life.
- Power-Band Belts for Better Lateral Rigidity.
- Non-corroding Cast Aluminum Sheaves.
- Heavy-Duty Fan Shaft Bearings with L-10 Life of 75,000 - 135,000 hrs.
- All Other Components are of Corrosion Resistant Materials.

Water Saver Drift Eliminators

- Reduce drift rate to 0.001%.
- Made from corrosion resistant PVC for long life.

"Clean Pan" Basin Design

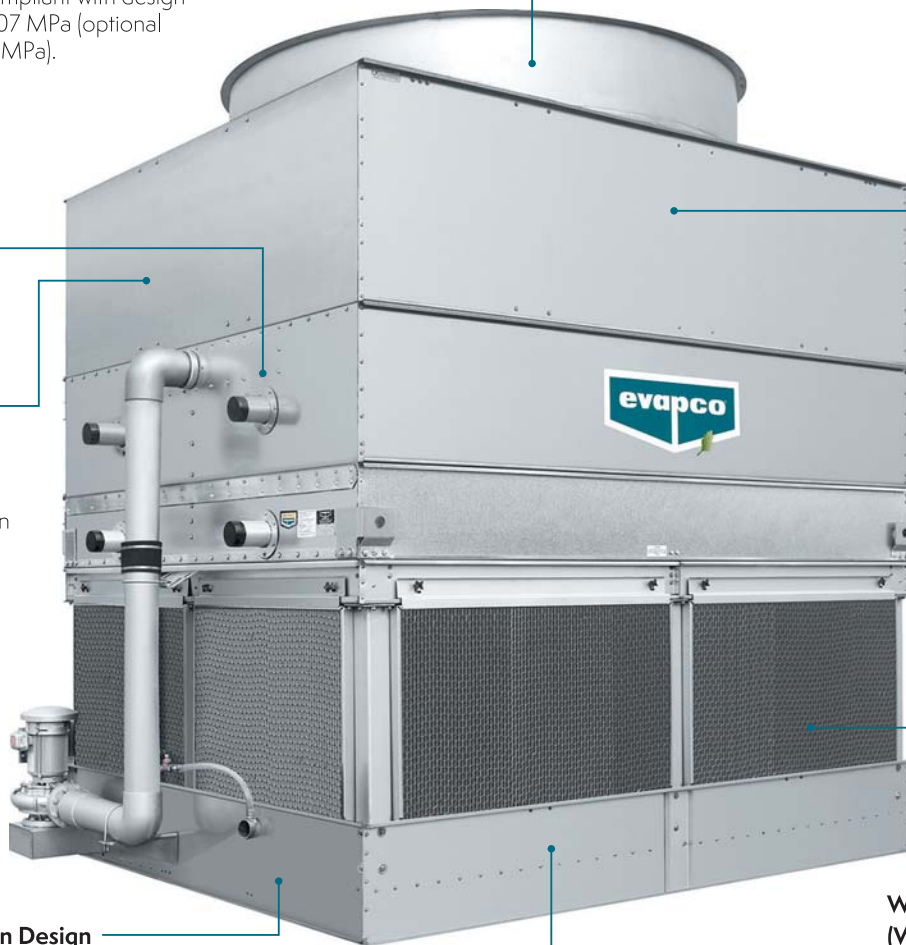
- Access from all four sides.
- Large open area simplifies maintenance.
- Basin may be inspected with pumps running.
- Sloped basin design prevents sediment buildup, biological film and standing water.

General Construction

- G-235 Mill Hot-Dip Galvanized Steel Panel Construction as standard.
- Available in both 304 and 316 Stainless Steel Panel Construction.

WST Air Inlet Louvers (Water and Sight Tight)

- Easily removable for access.
- Design keeps sunlight out – preventing biological growth.
- 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' (1.2m x 1.8m) to 24' x 40' (7.3m x 12.2m) 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.

Ellipti-fin® Heat Transfer Technology

- Extended surface fins on all rows to maximize surface area.
- Improved wet and dry capacity, within the same footprint, than the ATC-E.
- Lower refrigerant charge.
- ASME B31.5 compliant with design of 300 psig/2.07 MPa (optional 400 psig/2.76 MPa).

Fan Options

- Aluminum Low-Sound Fan.
- Wide Cord Super Low Sound Fan.
- Up to 15 dB(A) sound reduction @ 50 ft (15m).

Drive System

- Totally Enclosed Fan Motors assures Long Life.
- Power-Band Belts for Better Lateral Rigidity.
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Water Saver Drift Eliminators

- Reduce drift rate to 0.001%.
- Made from corrosion resistant PVC for long life.

"Clean Pan" Basin Design

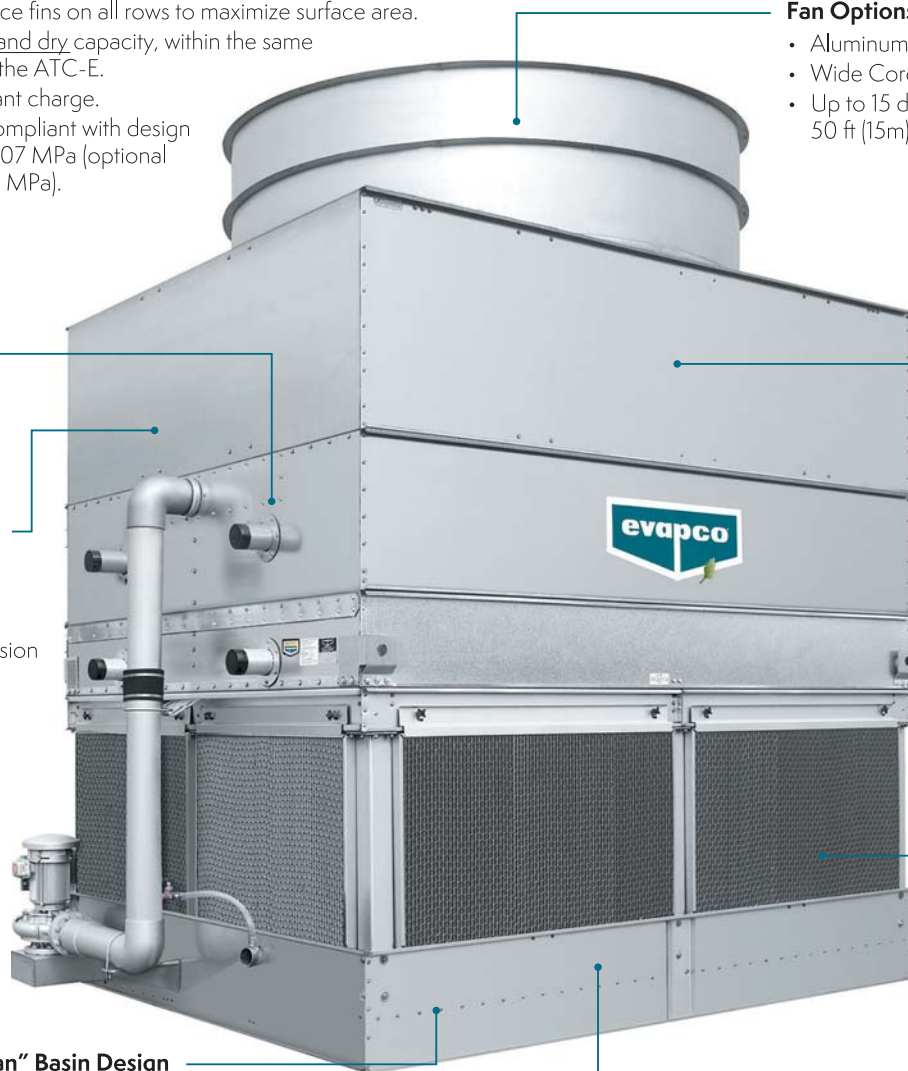
- Access from all four sides.
- Large open area simplifies maintenance.
- Basin may be inspected with pumps running.
- Sloped basin design prevents sediment buildup, biological film and standing water.

General Construction

- G-235 Mill Hot-Dip Galvanized Steel Panel Construction as standard.
- Available in both 304 and 316 Stainless Steel Panel Construction.

WST Air Inlet Louvers (Water and Sight Tight)

- Easily removable for access.
- Design keeps sunlight out – preventing biological growth.
- Keeps water in while keeping dirt and debris out.



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' (1.2m x 1.8m) to 24' x 40' (7.3m x 12.2m) and capacities from 87 to 2,728 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.

Thermal-Pak® II Heat Transfer Technology

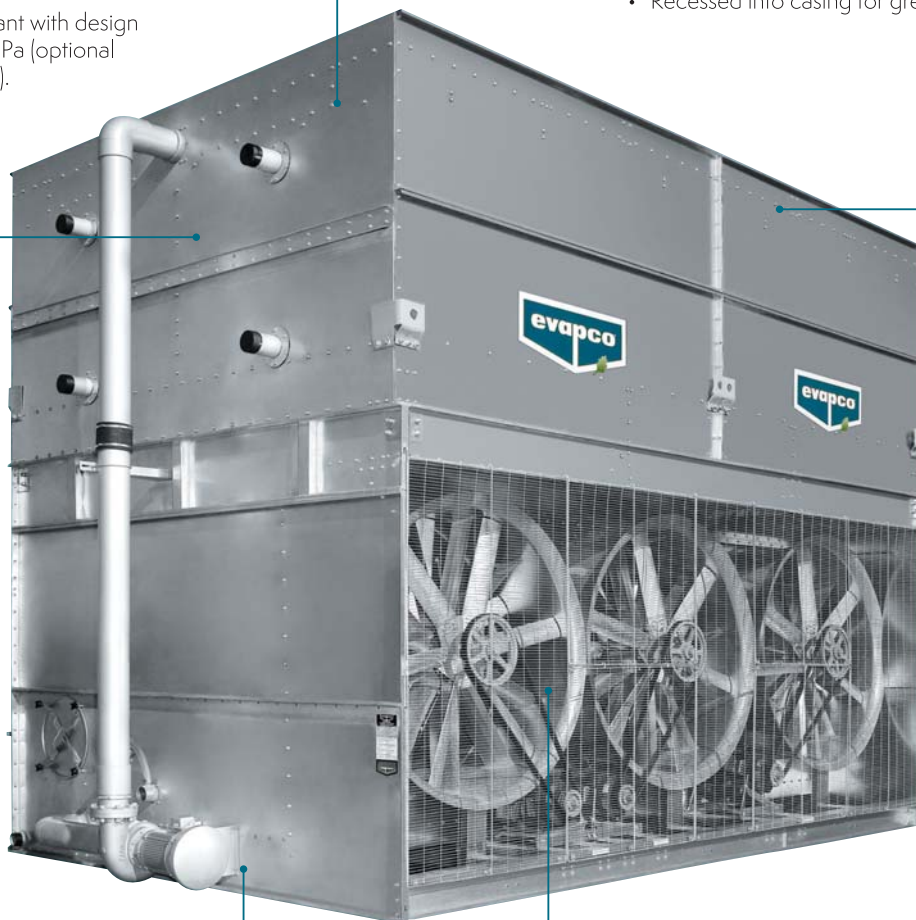
- High heat transfer efficiency due to tube geometry and orientation.
- Lower refrigerant charge.
- Optional TITAN 304L or 316L Stainless Steel Coil.
- ASME B31.5 compliant with design of 300 psig/2.07 MPa (optional 400 psig/2.76 MPa).

Water Saver Drift Eliminators

- Reduce drift rate to 0.001%.
- Saves water and reduces water treatment cost.
- Improved structural integrity.
- Recessed into casing for greater protection.

General Construction

- G-235 Mill Hot-Dip Galvanized Steel Panel Construction as standard.
- Available in both 304 and 316 Stainless Steel Panel Construction.



Sloped Pan Bottom

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

Individual Fan Drive System

- Increased flexibility for improved capacity control.
- Greater reliability through redundancy.
- 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.

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.

Thermal-Pak® II Heat Transfer Technology

- High heat transfer efficiency due to tube geometry and orientation.
- Lower refrigerant charge.
- Optional TITAN 304L or 316L Stainless Steel Coil.
- ASME B31.5 compliant with design of 300 psig /2.07 MPa (optional 400 psig/2.76 MPa).

Water Saver Drift Eliminators

- Reduce drift rate to 0.001%.
- Saves water and reduces water treatment cost.
- Improved structural integrity.
- Recessed into casing for greater protection.

General Construction

- G-235 Mill Hot-Dip Galvanized Steel Panel Construction as standard.
- Available in both 304 and 316 Stainless Steel Panel Construction.



LSC-E

LRC

Centrifugal Fans

- Handle up to 1/2" (125Pa) of static to assist in flexible ducting designs.

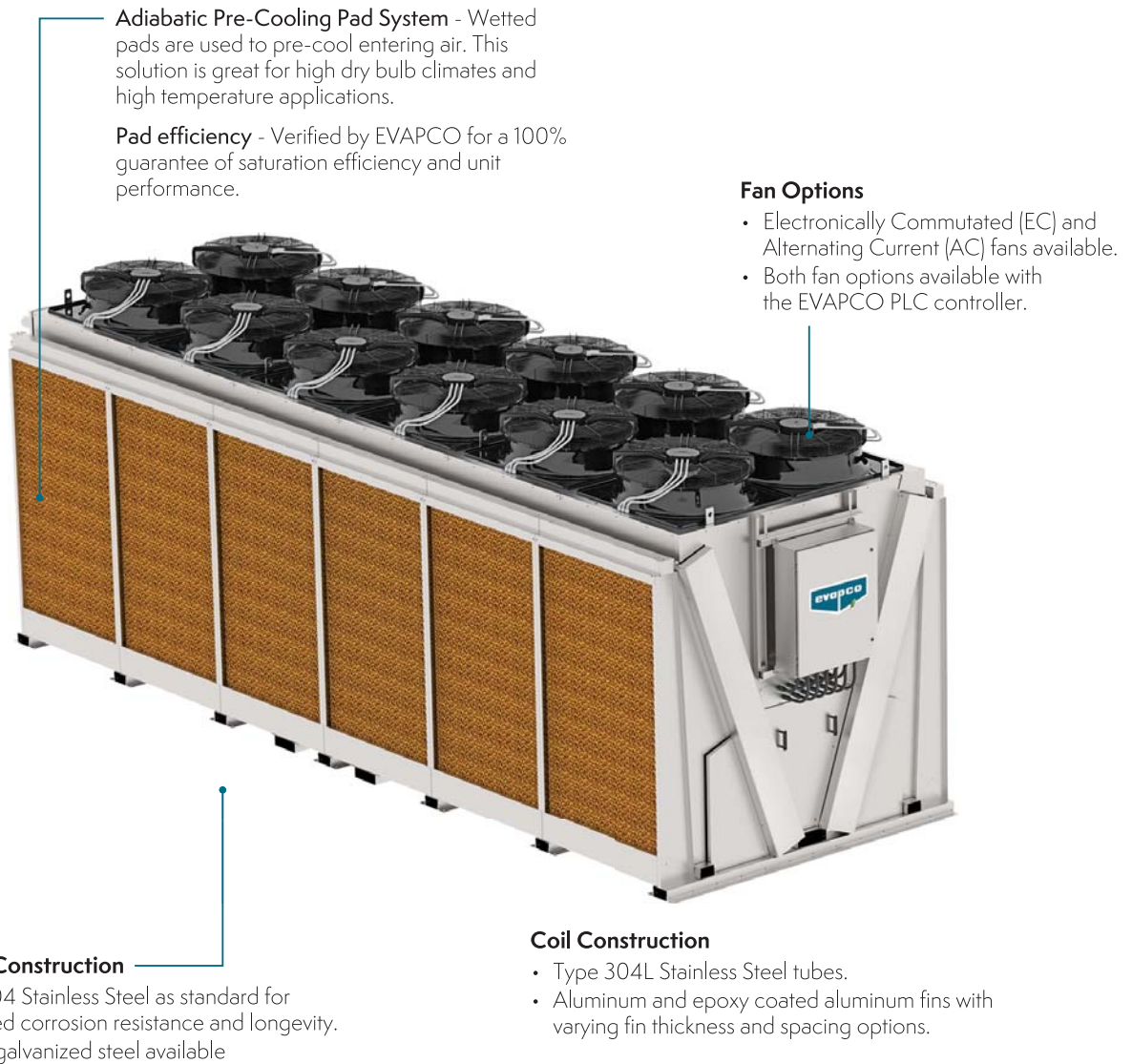
Totally Enclosed Fan Motors and Superior Drive System

- 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

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



Adiabatic Pre-Cooling Pad System - Wetted pads are used to pre-cool entering air. This solution is great for high dry bulb climates and high temperature applications.

Pad efficiency - Verified by EVAPCO for a 100% guarantee of saturation efficiency and unit performance.

Fan Options

- Electronically Commutated (EC) and Alternating Current (AC) fans available.
- Both fan options available with the EVAPCO PLC controller.

General Construction

- Type 304 Stainless Steel as standard for increased corrosion resistance and longevity.
- G-235 galvanized steel available

Coil Construction

- Type 304L Stainless Steel tubes.
- Aluminum and epoxy coated aluminum fins with varying fin thickness and spacing options.

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, 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 air-cooled 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 Alternating Current (AC) fan motor designs



EC

- High Efficiency
- Zero Maintenance
- Integral Speed Control
- Inherently Low Sound



AC

- Direct drive
- Zero maintenance permanently sealed bearings
- VFD ready
- Severe Duty



Coil Construction

- Type 304L Stainless Steel tubes.
- Aluminum and epoxy coated aluminum fins with varying fin thickness and spacing options.

Common Terminal Box

- All motors factory wired
- Saves time in the field



Factory Mounted & Wired Controls

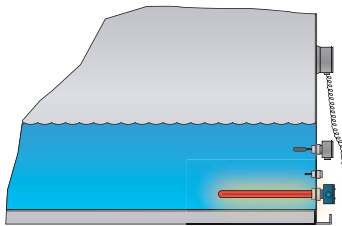
- EVAPCO PLC Panel (EC Motors)
- EVAPCO PLC/VFD Panel (AC Motors)
- Single point power connection

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 40°F/4.4°C pan water temperature with the fans off and an ambient air temperature of 0°F/-18°C, -20°F/-29°C, or -40°F/-40°C. They are furnished with a thermostat low water protection to cycle the heater on when required and 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.



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 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.

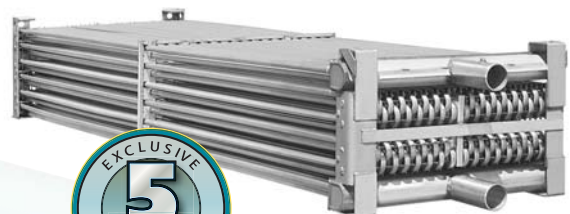


Electric Water Level Control

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

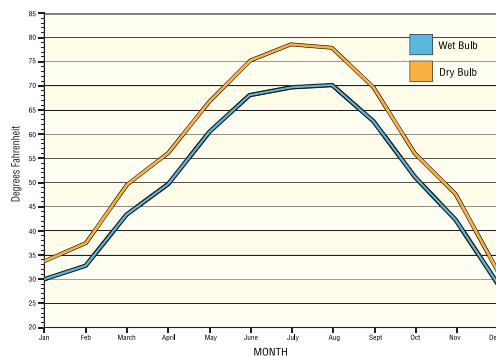
EVAPCO offers the options of Type 304L or Type 316L stainless steel construction using the Thermal Pak® II coil design. Highly efficient heat transfer coils with the ultimate corrosion protection.



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 (2200 kW) condenser application at a meat processing facility near Wichita, KS comparing various condensing solutions.

Monthly Average Ambient Temperature
Wichita, KS

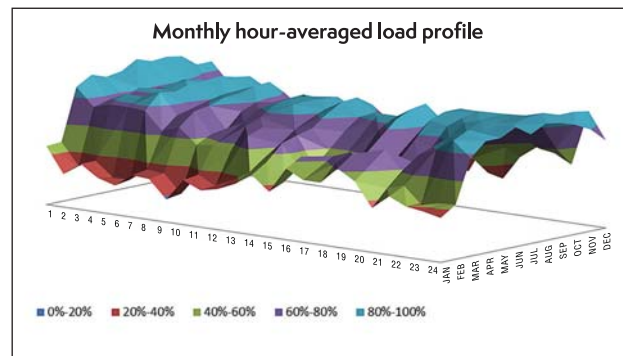


Weather Station: For Wichita, KS, the selected weather station is McConnell AFB

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: 5 Week Days, and 2 Weekend Days

Potable Water Cost for Wichita: Estimated at .0028 \$/gal

Waste Water Treatment Costs for Wichita: Estimated at .0031 \$/gal

Power Costs: Estimated at .0637 \$/kwh

Water and Energy Analysis*

Selected Weather Station: McConnell AFB
 Condensing Temperature: 95°F (35°C)
 Wet Bulb Temperature: 78°F (25.6°C)
 Refrigerant: NH3

Load Profile: Beef
 Week Days: 5
 Weekend Days: 2
 Cycle of Concentration: 4

	Traditional Evaporative Condenser	Extended Surface Evaporative Condenser	Air-Cooled with Adiabatic Pads
Model Number:	ATC-791E	eco-ATC-761A	EAVCA-9120ZA320P7-625AUSP04
Quantity:	1.00	1.00	2.00
Total Estimated Water Usage per year (gal.)	4,616,650	4,008,150	2,069,780
Total Estimated Water Cost per year (USD)	16,490	14,320	7,400
Total Estimated Energy Usage per year (kWh)	92,780	87,490	68,200
Total Estimated Energy Cost per year (USD)	5,910	5,570	4,350



OUR PRODUCTS ARE MANUFACTURED WORLDWIDE.



★ World Headquarters/ Research and Development Center
■ EVAPCO Facilities



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Committed to making life easier, more reliable and more sustainable for people everywhere