

FM Approval – Based on Rigorous Testing and Analysis



The foremost measure of a cooling tower's ability to survive exposure to a fire and natural hazards such as wind, ice, snow and earthquakes is a Certification of Compliance according to FM Approvals' Standard for Cooling Towers, Class Number 4930.

FM Approvals, is a subsidiary of FM Global, the largest industrial and commercial insurance company in the world. FM Approvals provides a third-party certification based on rigorous testing according to Standard 4930. Approval certifies compliance with full scale fire performance, rigorous natural hazards testing, seismic analysis, and quality audits of combustible components.

FM Global's Property Loss Prevention Data Sheets 1-6 (1.0 Scope) for cooling towers prescribes the additional thermal performance capacity or redundancy requirements for FM Approved cooling tower installations. FM Approved installations are categorized as with "limited combustibility"

not requiring additional capacity, "single cell" towers with limited fire spread or "multi-cell" towers requiring at least one additional cell.

All Series ESX and ESXR products are FM Approved and characterized as "limited combustibility" meaning these product DO NOT require additional thermal capacity or redundancy.

Series ESX and ESXR FM Approved products may be constructed with FR-FRP, concrete or steel structures that are single cell, multi-cell or round configurations; double or single air inlet; mechanical draft or natural draft; installed at grade or rooftop mounted and NOT requiring additional thermal capacity or redundancy.

FM Approved towers are identified by the FM Approved mark and are listed in the online FM Approvals Guide at <http://www.approvalguide.com>.

An FM Approved cooling tower may be the right choice for you if...

- ✓ you are insured by FM Global and require or prefer FM Approved products
- ✓ you are not insured by FM Global, but you can benefit from your insurer if you use third-party certified products
- ✓ you do not want to invest in and maintain a fire protection system
- ✓ you are concerned about damage, recovery, and losses caused by fire and natural hazards
- ✓ you seek uninterrupted operations and assured productivity

Now you have a multitude of field erected FM Approved choices.

- Crossflow (ESX and ESXR) or Counterflow (ES and ESP) Designs
- FR Fiberglass, steel or Concrete Structures
- Splash or Film Heat Transfer Media
- Single Cell, Multi-cell or Round
- Double or Single Air Inlets
- Installation at Grade or Rooftop



- ★ World Headquarters/ Research and Development Center
- EVAPCO Facilities

EVAPCO, Inc., – World Headquarters & Research/Development Center

EVAPCO, Inc. • P.O. Box 1300 Westminster, MD 21158 USA
Phone: 410-756-2600 Fax: 410-756-6450 E-mail: marketing@evapco.com

EVAPCO North America

EVAPCO, Inc.
World Headquarters
P.O. Box 1300
Westminster, MD 21158 USA
410-756-2600 p | 410-756-6450 f
marketing@evapco.com

EVAPCO East
5151 Allendale Lane
Taneytown, MD 21787 USA
410-756-2600 p | 410-756-6450 f
marketing@evapco.com

EVAPCO East
Key Building
2910 Francis Scott Key Hwy
Taneytown, MD 21787
410-756-2600 p | 410-756-6450 f
marketing@evapco.com

EVAPCO Midwest
1723 York Road
Greenupt, IL 62428 USA
217-923-3431 p | 217-923-3300 f
evapcomw@evapcomw.com

EVAPCO West
1900 West Almond Avenue
Madera, CA 93637 USA
559-673-2207 p | 559-673-2378 f
contact@evapcowest.com

EVAPCO Iowa
925 Quality Drive
Lake View, IA 51450 USA
712-657-3223 p | 712-657-3226 f

EVAPCO Iowa
Sales & Engineering
215 1st Street, NE
P.O. Box 89
Medford, MN 55049 USA
507-446-8005 p | 507-446-8239 f
evapcomn@evapcomn.com

EVAPCO Newton
701 East Jordan Street
Newton, IL 62448 USA
618-783-3433 p | 618-783-3499 f
evapcomw@evapcomw.com

EVAPCOLD
521 Evapco Drive
Greenup, IL 62428 USA
217-923-3431 p
evapcomw@evapcomw.com

EVAPCO-BLCT Dry Cooling, Inc.
1011 U.S. Highway 22 West
Bridgewater, NJ 08807 USA
908-379-2665 p
info@evapco-blct.com

Refrigeration Valves & Systems Corporation
A wholly owned subsidiary of EVAPCO, Inc.
1520 Crosswind Drive
Bryan, TX 77808 USA
979-778-0095 p | 979-778-0030 f
rvs@rvscorp.com



EvapTech, Inc.
A wholly owned subsidiary of EVAPCO, Inc.
2644 S. 96th Street
Edwardsville, KS 66111 USA
913-322-5165 p | 913-322-5166 f
marketing@evaptech.com

Tower Components, Inc.
A wholly owned subsidiary of EVAPCO, Inc.
5960 US Highway 64 East
Ramseur, NC 27316 USA
336-824-2102 p | 336-824-2190 f
mail@towercomponentsinc.com

South America

EVAPCO Brasil
Equipamentos Industriais Ltda.
Al. Vênus, 151 – CEP: 13347-659
Indaiatuba – São Paulo – Brasil
(55+11) 5681-2000 p
vendas@evapco.com.br

Fan Technology Resource
Rodovia Waldomiro
Correa de Camargo, km 53, 7
Cruz das Almas – Indaiatuba
São Paulo, Brasil 13308-200
55 (11) 4025-1670
fantr@fantr.com

EVAPCO Europe

EVAPCO Europe BVBA
European Headquarters
Heersterveldweg 19
Industrieterrein Oost
3700 Tongeren, Belgium
(32) 12-395029 p | (32) 12-238527 f
evapco.europe@evapco.be

EVAPCO Europe, S.r.l.
Via Ciro Menotti, 10
I-20017 Passirana di Rho
Milan, Italy
(39) 02-939-9041 p | (39) 02-935-00840 f
evapcoeuropa@evapco.it

EVAPCO Europe, S.r.l.
Via Dosso 2
23020 Piateda
Sondrio, Italy

EVAPCO Europe GmbH
Insterburger Straße 18
40670 Meerbusch, Germany
(49) 2159 6956 18 p | (49) 2159 6956 11 f
info@evapco.de

EVAPCO Air Solutions
A wholly owned subsidiary of EVAPCO, Inc.
Knešgårdvej 115
DK-9440 Aabybro, Denmark
(45) 9824 4999 p | (45) 9824 4990 f
info@evapco.dk

EVAPCO Air Solutions GmbH
Berenbosteler Str. 76 A
30823 Garbsen, Germany
(49) 5137 93875-0 p | (49) 5137 93875-20 f
info@evapcoas.de

Evap Egypt Engineering Industries Co.
A licensed manufacturer of EVAPCO, Inc.
51 El Nasr Road
Nasr City, Cairo, Egypt
2 02 24022866/2 02 24044997 p
2 02 24044667/2 02 24044668 f
primacool@link.net / shady@primacool.net

EVAPCO S.A. (Pty.) Ltd.
A licensed manufacturer of EVAPCO, Inc.
18 Quality Road
Isando 1600
Republic of South Africa
(27) 11-392-6630 p | (27) 11-392-6615 f
evapco@evapco.co.za

EVAPCO Asia Pacific

EVAPCO Asia/Pacific Headquarters
1159 Luoning Road
Baoshan Industrial Zone
Shanghai 200949, P.R. China
(86) 21-6687-7786 p | (86) 21-6687-7008 f
marketing@evapcochina.com

EVAPCO (Shanghai) Refrigeration Equipment Co., Ltd.
1159 Luoning Rd., Baoshan Industrial Zone
Shanghai 200949, P.R. China
(86) 21-6687-7786 p | (86) 21-6687-7008 f
marketing@evapcochina.com

Beijing EVAPCO Refrigeration Equipment Co., Ltd.
No. 66 the 4th Block, Yanxi Economic Development Zone
Huairou District
Beijing, P.R. China Postcode: 101407
010-6166-7238 p | 010-6166-7295 f
evapcoobj@evapcochina.com

EVAPCO Australia (Pty.) Ltd.
34-42 Melbourne Road
P.O. Box 436
Riverstone NSW 2765, Australia
(61) 2 9627-3322 p | (61) 2 9627-1715 f
sales@evapco.com.au

EVAPCO Composites Sdn. Bhd
No. 70 (Lot 1289) Jalan Industri 2/3
Rawang Integrated Industrial Park
48000 Rawang, Selangor, Malaysia
(60-3) 6092-2209 p | (60-3) 6092-2210 f



EvapTech Asia Pacific Sdn. Bhd
A wholly owned subsidiary of EvapTech, Inc.
B-61, IOI Boulevard
Jalan Kenari 5, Bandar Puchong Jaya
47170 Puchong, Selangor, Malaysia
(60-3) 8070-7255 p | (60-3) 8070-5731 f
marketing-ap@evaptech.com

Series **ESX** & Series **ESXR** CROSSFLOW COOLING TOWERS



- Industrial Process
- Power Generation



EvapTech...Field Erected Cooling Towers and AfterMarket Services

Visit EvapTech's Website at: <http://www.evaptech.com>





EvapTech® is a premier cooling tower designer, manufacturer and contractor providing Innovative Cooling Solutions for customer needs in the power generation, industrial, refrigeration and HVAC evaporative cooling markets. EvapTech offers new and replacement field erected cooling towers and a variety of cooling tower aftermarket services.

EvapTech is a wholly owned subsidiary of Evapco, Inc. The combined capabilities of EvapTech and Evapco provide field erected and factory assembled products that satisfy nearly all markets.



Since its founding in 1976, Evapco has become an industry leader in the engineering and manufacturing of quality heat transfer products around the world. Evapco's powerful combination of financial strength and technical expertise has established the company as a global manufacturer of market-leading products.

Evapco is an employee owned company with a strong emphasis on research and development and modern manufacturing facilities. With an ongoing commitment to research and development programs, Evapco provides the most advanced products and components in the industry.

Research Powered Solutions

EvapTech is continually seeking new evaporative cooling technologies and unique solutions to improve the performance, quality and reliability of its products and components.

Cooling tower products are challenged by a variety of thermal, hydraulic, chemical, mechanical and structural demands. To satisfy these demands, EvapTech employs a strategy involving extensive laboratory research, rigorous thermal and physical testing, and validation by field testing installed products.

EvapTech's products and components such as the fill, eliminators, and nozzles, are created and verified in the Wilson E. Bradley Research & Development Center in Maryland. This R & D Center features customized laboratories designed to perform tests through a wide range of environmental conditions. EvapTech's products are also tested in third-party laboratories such as the Natural Hazards Laboratory in Rhode Island operated by FM Approvals.

EvapTech is a participating manufacturer to CTI Standard STD-202 (Publication of Test Results). The EX, ESX and ESXR product lines share the same functional heat transfer and drift eliminator components although the ESX and ESXR utilize custom component materials. The use of these heat transfer and eliminator designs assure owners reliable thermal performance and low drift rates.

FM Approved Tower Full Scale Fire and Component Testing.



ESX full-scale fire test cell.



Heptane ignition source for full-scale fire testing



Following a successful Series ESX full-scale fire test there is minimal damage.



SafeWall™ cyclic wind pressure testing



Airborne debris (missile) testing



Series **ESX** & Series **ESXR** – Meeting the FM Challenge; Loss Prevention Through Technology

The FM Approved Series ESX and ESXR evolved from the proven EvapTech crossflow Series EX product line. These products share high quality fire-retardant fiberglass pultrusions with proven structural integrity and a design methodology confirmed by FM Approvals Standard Class 4930 for resistance to the most extreme natural hazards. The ESX and ESXR designs are also available with concrete and steel structures

The Series ESX and ESXR products use EvapTech's industry leading splash fill system. Unlike crossflow systems using PVC splash bars, EvapTech's splash fill system uses ArchBar™ fill made using fire retardant high density polyethylene (FR-HDPE). When exposed to a fire hazard, the open mesh FR-HDPE ArchBar bars "melt" falling away from and not propagating the fire hazard. The FR-HDPE ArchBar material simply does not support and spread combustion when exposed to a fire hazard whereas PVC material does combust and can spread quickly. The ArchBar fill systems are available in various bar spacing and orientation to airflow allowing the thermal design to be customized to each application. The ArchBar splash bars are supported by stainless steel grids assuring a long-life installation.

Similar to EvapTech's FM Approved ESP counterflow products, the Series ESX and ESXR designs rely on custom PVC drift eliminators known as Franklin Eliminators™ derived from the highly successful Series ESP product line. The custom formulated PVC has a limited combustibility rating with self-extinguishing characteristics to inhibit the spread of fire.

The Series ESX and ESXR products use SafeWall™ custom fire retardant fiberglass casing technology to resist natural hazards such as airborne missiles and hurricane force winds. This material is used for both endwalls and transverse partitions

Comparison of the Series ESX and ESXR

	Series ESX	Series ESXR
FM Approved Certification Category	Limited Combustibility Design	Limited Combustibility Design
Additional Thermal Capacity or Redundancy	None Required	None Required
Tower Configuration	Single cell & inline multi-cell	Round
Airflow Entry to Tower	Single or Double Air Inlets	Single Air Inlet
Air Movement Drivers	Motor Driven Fans	Motor Driven Fans or Natural Draft Shell
Structure Materials	FR-FRP or Concrete	FR-FRP or Concrete
ArchBar Splash Fill Details	Parallel & Perpendicular to Airflow; Various Bar Spacings	Parallel & Perpendicular to Airflow; Various Bar Spacings
Franklin Drift Eliminators	Custom PVC	Custom PVC



Full scale Series ESX crossflow FM test cell.



Series ESX test cell under construction with FR fan cylinder.



Series ESX FM test cell with ArchBar™ splash fill and stainless steel grids.



Fire-retardant water distribution system.



Series ESX FM test cell with Franklin™ eliminators



Series ESX SafeWall™ custom fire retardant fiberglass casing and partitions..

Key Advantages of Series ESX & ESXR

- **Reliability of Operations** – Minimal loss of performance and interruption to operations due to fire.
- **Hardened to Survive** - SafeWall™ technology resists damage and compromised thermal performance resulting from airborne debris and wind pressures created by severe storms and hurricanes. The durability of SafeWall™ can improve operation, maintenance, and reduce repair costs for the life of the product.
- **Cost Effective** – The Series ESX & ESXR products have lower installed costs than comparable towers provided with fire protection systems.
- **Low Drift Rates** – The best available control technology for drift rates is available with DriAir™ eliminators.
- **Product Quality is a Given** – Regular quality audits of all combustible components by FM Approvals assures the same FM Approved product is provided for every project.
- **Durability of Structures** – FR Fiberglass, concrete and steel structures offer extended product service compared to factory assembled products.



Series **ESX**

Series **ESXR**