



**evoqua**  
WATER TECHNOLOGIES



# **VAF™ FILTRATION SYSTEMS**

**COOLING TOWER WATER FILTRATION SYSTEMS**

# COOLING TOWER WATER FILTRATION

## WHY IS COOLING TOWER WATER FILTRATION IMPORTANT?

The US Department of Energy recently conducted a test comparing cooling tower performance with and without filtration. They found that with filtration the following savings can be expected:

- 10% Energy Savings
- 80% Tower Cleaning Maintenance Savings
- 14% Chemical Use Savings

Source: *Evaluation of Side Stream Filtration Technology at Oak Ridge National Laboratory, U.S.Department of Energy, September 2014*

## ADDITIONAL BENEFITS

- Reduces buildup of Legionella habitat and food source
- Extends system life

Ideal nutrients for Legionella consist of the organics, algae, silts and iron oxide that settle in the cooling tower basin. This habitat and food source is significantly reduced by using a cooling tower filtration system that includes agitation nozzles installed in the basin.

## CHOOSING THE RIGHT TECHNOLOGY FOR YOUR COOLING TOWER APPLICATION

There are numerous benefits to selecting a screen filter for cooling tower applications; however, Evoqua’s VAF™ brand also offers a complete line of separator skids. Separators are well suited for installations where cost is the primary factor and also where only larger, heavier particles are needing to be removed. The chart below outlines the primary differences in the technologies.

Technology Type	Initial Cost	Particle Removal	Maintenance and Operational Costs	Backwash Waste	Energy Costs	Legionella Prevention
Centrifugal Separators	Low	Removal of 98% solids with 2.6 specific gravity and higher.	No moving parts. Purge or backwash components require routine inspection.	Periodic backwash, low waste.	Requires 10-15 psi pressure loss to operate efficiently 24 hrs/day.	Not effective - cannot remove organics, algae, silts, or iron oxide that provide Legionella habitat.
Automatic Screen Filters	Medium	Removal of all particulate 10 micron and larger.	Contain some moving parts that may require maintenance and replacement.	Backwash on pressure differential only when required, low waste.	Pressure loss is 0 increasing to 7 psi and then cleans, operates efficiently 8 hrs/day.	Very effective especially when combined with VAF brand basin agitation system.



# COOLING TOWER WATER FILTRATION AND BASIN CLEANING SYSTEMS

## COOLING WATER SYSTEM FILTRATION AND BASIN CLEANING WILL:

- Reduce energy costs by maintaining consistently high heat transfer efficiencies
- Reduce Legionella habitat and food source
- Reduce chemical costs by increasing chemical effectiveness
- Reduce maintenance costs of the cooling tower and chiller/heat exchanger
- Reduce equipment replacement costs by increasing equipment life

LCF and CTF cooling tower filtration systems are designed for highly efficient cleaning of cooling tower water systems and basins with simplicity and low cost.

**LCFX and CTFX filtration systems are revolutionary in their *low energy* design while maintaining clean cooling tower water systems and basins.**

By incorporating zone control technology with unique low cost VFD/PLC pump controls, multiple cooling tower systems can be kept clean with a single X™ filtration system at a low pressure and flow rate.

## CTFX-SERIES



CTFX multiple basin filtration systems are available in flow rates from 34 m<sup>3</sup>/hr (150 gpm) to any flow rate by using multiple filters.

## LCF-SERIES



LCF filtration systems have a small footprint and are available with flow rates from 11 to 34 m<sup>3</sup>/hr (50 to 150 gpm).

## CTF-SERIES



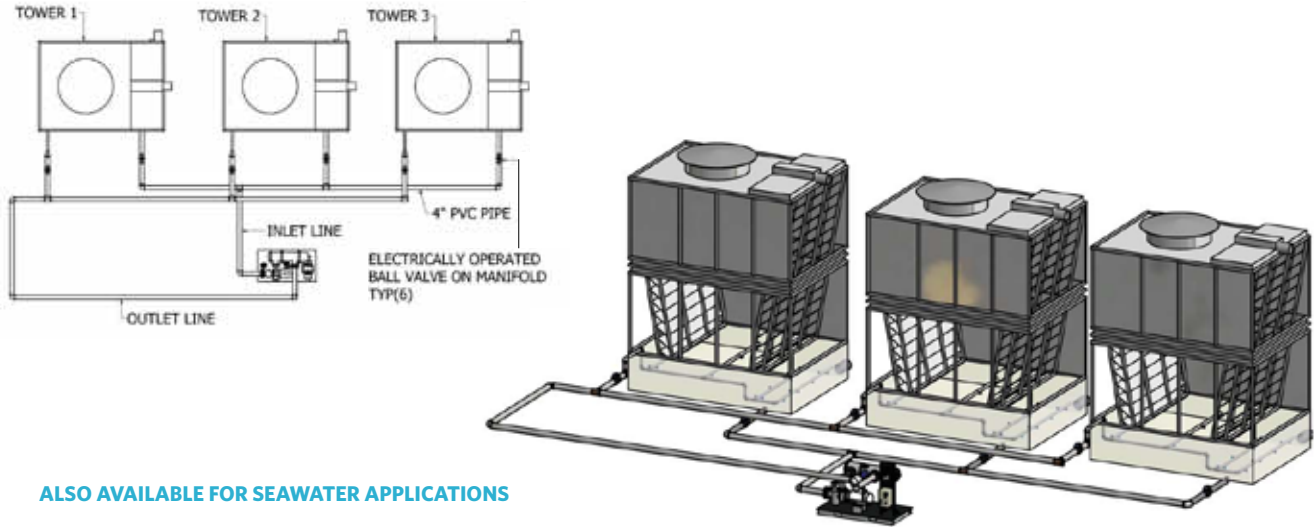
CTF filtration systems have a compact footprint that can be customized to fit constrained areas. Flow rates are available from 34 m<sup>3</sup>/hr (150 gpm) to any flow rate by using multiple filters.

## LCFX-SERIES



LCFX multiple basin filtration systems are available in flow rates from 11 to 34 m<sup>3</sup>/hr (50 to 150 gpm).

## X™ SYSTEM FOR MULTI-TOWER



ALSO AVAILABLE FOR SEAWATER APPLICATIONS

## COOLING TOWER WATER AND BASIN CLEANING WITH CENTRIFUGAL SEPARATORS

### LCS-SERIES



Includes: VHS separator, isolation valve and manual purge valve mounted on a painted steel skid. Options include auto purge and bag recovery vessel.

### CTS-SERIES



Includes: VHS separator, isolation valve, automatic timer and purge valve and pump strainer mounted on an epoxy coated steel skid. Options include bag recovery vessel.

## TURBULATOR BASIN AGITATION SYSTEM

When used in conjunction with filter skids that include a pump, turbulator agitation nozzles will...

- Reduces buildup of Legionella habitat
- Keep solids suspended for removal
- Significantly reduce maintenance requirements
- Enhance chemical performance



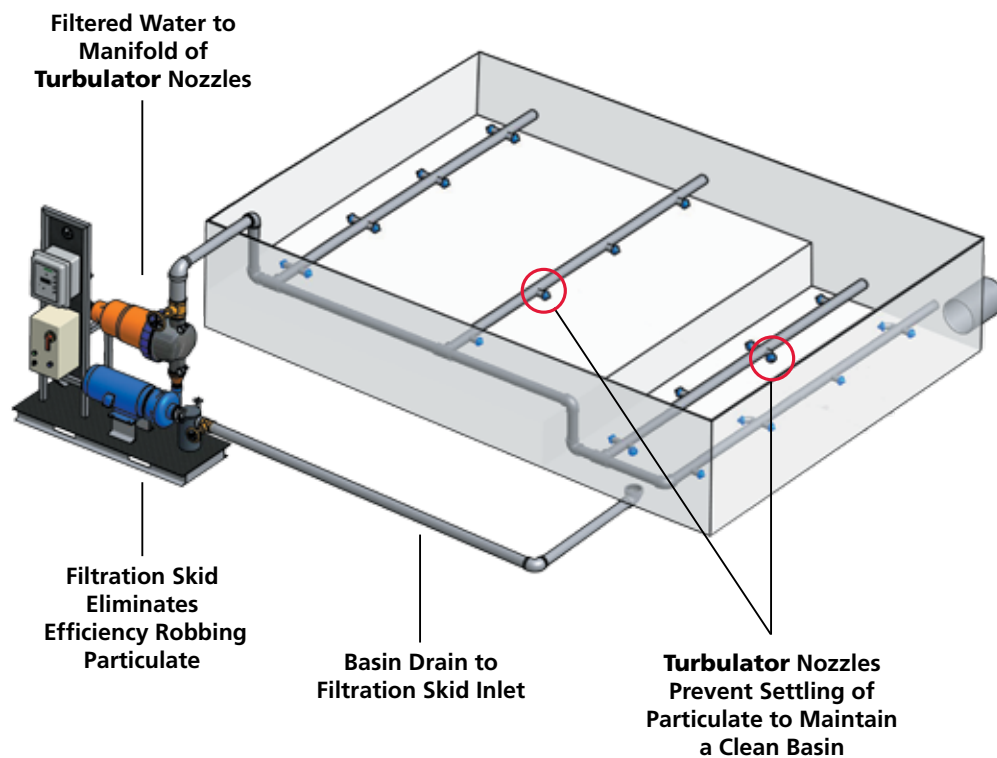
## TYPICAL INSTALLATION



Before Turbulator



After Turbulator



## MEDICAL CENTER – SEATTLE, WASHINGTON

Seven 300 ton cooling towers utilize LCF screen filter skids with a turbulator eductor nozzle agitating system filtering 23m<sup>3</sup>/hr (100 gpm) at 50 micron. These small, economical filter systems only have to operate a few hours a day to maintain a clean basin.



## APPLICATIONS

### **Airport - Arizona**

A single CTFX-500 screen filter skid along with a turbulator nozzle basin agitation system were installed to filter three 300 ton cooling tower basins. The flow rate is 57 m<sup>3</sup>/hr (250 gpm) to each basin using a 50 micron screen. This project illustrates how one CTFX filtration system can effectively clean three cooling tower basins.



### **Entertainment Complex - Melbourne, Australia**

VAF brand V-Series filters were supplied to replace deep bed media, centrifugal separators, and piston operated self-cleaning filters. These older filtration technologies were not meeting the end-user's strict Key Performance Indicators for cleanliness, and subsequently the cooling systems required an unacceptably high frequency of manual cleaning.



### **Data Center - Colorado Springs, Colorado**

VAF brand skid mounted V-Series filters were provided to replace centrifugal separators due to their ineffectiveness in the removal of fine silts and organics from four cooling tower basins. Four dual CTF-1500 systems were supplied with 10 micron screens and booster pump that filter a flow rate of 159 m<sup>3</sup>/hr (700 gpm) per system. The basins, which had accumulated several inches of bottom silt, were cleaned within the first several days of operation.





## ABOUT EVOQUA

Evoqua Water Technologies is the global leader in helping municipalities and industrial customers protect and improve the world's most fundamental natural resource: water. Evoqua has a more than 100-year heritage of innovation and industry firsts, market-leading expertise, and unmatched customer service, where it continues to transform water and wastewater. Its cost-effective and reliable treatment systems and services ensure uninterrupted quantity and quality of water, enable regulatory and environmental compliance, increase efficiency through water reuse, and prepare customers for next-generation demands.

Evoqua's unparalleled portfolio of proven brands, advanced technologies, mobile and emergency water supply solutions and service helps cities across the world provide and discharge clean water, and enable leisure and commercial industry to maximize productivity and profitability. For more information, visit [www.evoqua.com](http://www.evoqua.com).



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