



eVOQUA

WATER TECHNOLOGIES

VAF™
HYDROCYCLONE
SEPARATOR

**SOLIDS REMOVAL FOR
COMMERCIAL COOLING**



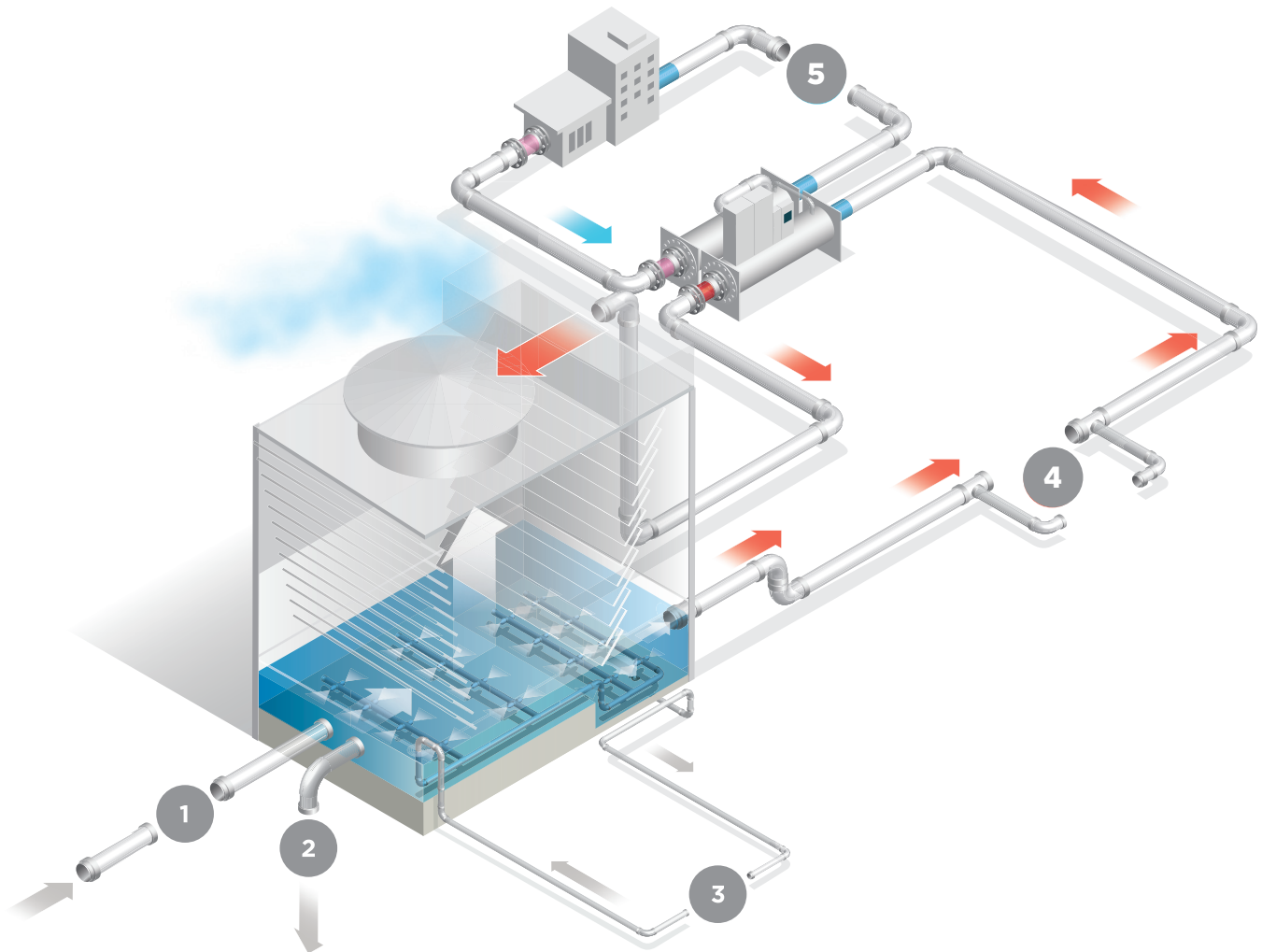
Why Filter Your Cooling Water?

As energy efficiency and resource conservation gain more importance, facility owners and engineers are recognizing the dramatic improvements they can achieve by efficiently removing solids from your cooling water.

Evoqua's full suite of filtration products for side-stream, basin, or full-flow filtration solutions are designed to continuously filter cooling water to remove suspended solids, reducing fouling, biological growth, and controlling other issues such as a scaling and corrosion.



Cooling Tower Water Treatment Process



Cooling Water Process	Evoqua Product Recommendations
1 Make-up Water	VAF V-Series Screen Filter VAF Hydrocyclone Separator
2 Blowdown Treatment	Contact Evoqua Representative
3 Basin Agitation and Filtration	VAF V-Series Screen Filter VAF Hydrocyclone Separator
4 Side Stream/Full Flow Filtration	Vortisand® Microsand C-Series Filter VAF V-Series Screen Filter VAF Hydrocyclone Separator
5 Chilled Loop Filtration	Vortisand Microsand C-Series Filter

VAF™ Hydrocyclone Separator: Features & Benefits

For commercial cooling facilities who are overwhelmed with high levels of sand and heavy debris present in cooling tower make-up water & cooling loop infrastructure the VAF™ Hydrocyclone Separator by Evoqua provides robust, automatic cleaning, and cost-effective solids removal for cooling tower operators saving customers in tower cleaning labor costs and solid waste disposal costs.

As an efficient method for keeping tower basins clean without interrupting the facilities processes, VAF Hydrocyclone Separators significantly reduce operations and maintenance costs, and most important, reduces the consumption of what is quickly becoming our most valuable resource: water.

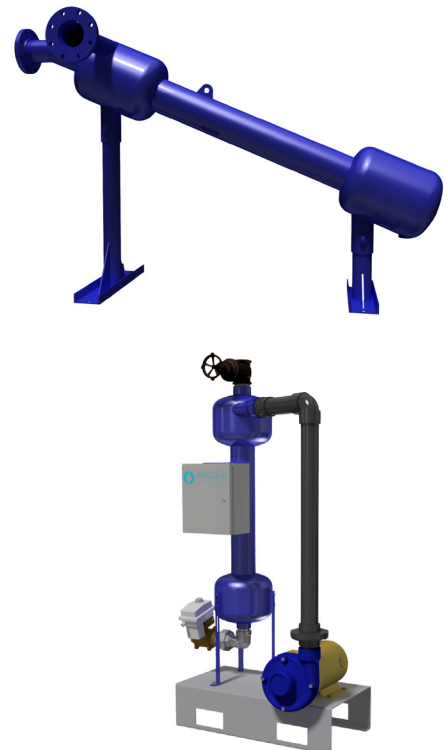
Evoqua's VAF brand Hydrocyclone Separators are effective in removing suspended particles from any flow stream of water where the specific gravity (density) of the particle(s) is heavier than the fluid it is in. The more significant the difference in gravity between the fluid and the particle, the greater the efficiency of the removal process. Depending on the specific gravity of the particle and the viscosity of the flow stream, very small and denser particles can be removed.

Water Efficiency: The optional recovery bag filter option can be installed on the flush line of the separator and collect and filter out TSS in the system. The cleaned water is sent back to the suction side of the pump for recycle, eliminating any wastewater generation.

Backed by Evoqua's decades of experience, VAF Hydrocyclone Separator provides performance and reliability at a cost-effective price.

FEATURES & BENEFITS

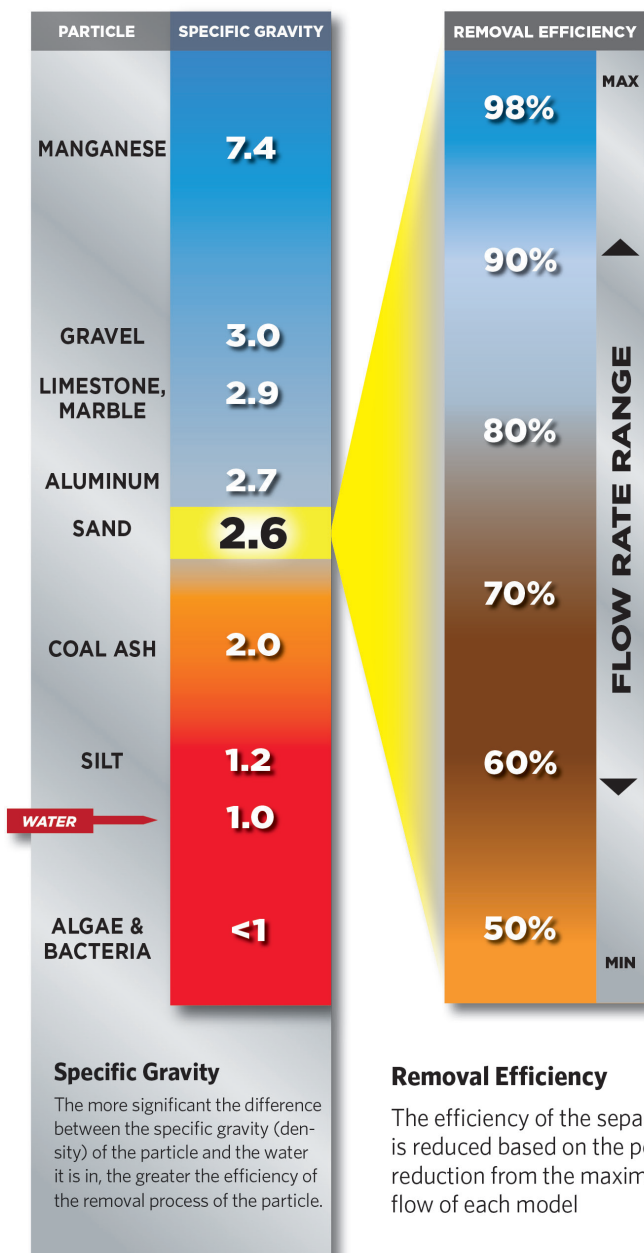
- Limited moving parts
- Removal of up to 98% solids 2.6 specific gravity and higher at maximum
- Flow rate (see back side)
- Heavy duty, corrosion resistant construction for a long service life
- Capacities of 1 to 1,771 m³/hr (4 to 7,800 gpm)
- Operating pressure 1.5 to 10 bar (25 psi to 150 psi)
- Simple installation
- Excellent pre-removal to reduce load on downstream filtration components
- Cost effective solution



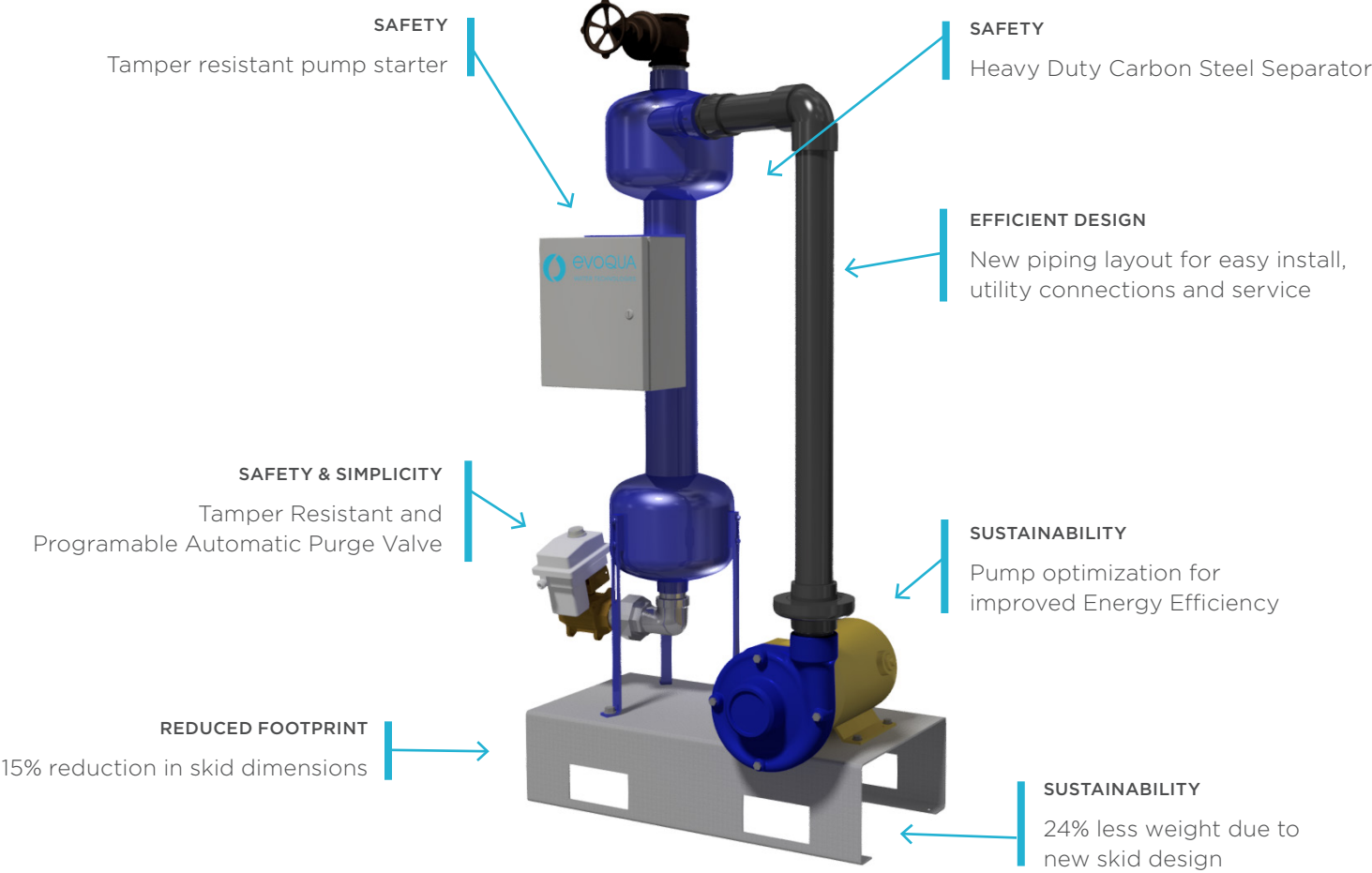
How it Works

Liquids and solids enter the unit and begin travelling in a circular flow. This centrifugal action forces heavier particles downward in a spiral motion to the separation chamber. The particles collect in this separation chamber and are purged from the system on a time interval. The processed or cleaned water is drawn from the separator's vortex and up through the outlet.

Consider a separator's use where any source of water contains contaminants with a weight of 2.6 specific gravity or higher. Separators are excellent for use as pretreatment in feedwater such as surface waters that contain high levels of sand or other large debris.



VAF™ Hydrocyclone Separator: A Closer Look



Sizing Your Side Stream for Open Loops

OPEN LOOPS

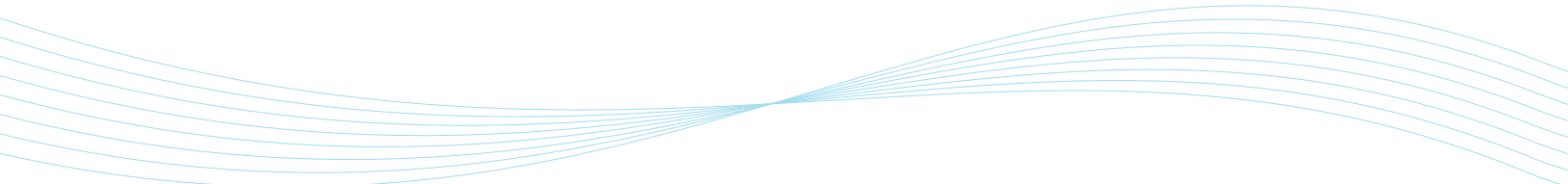
There are several possible configurations for installing a Hydrocyclone separator either on a basin, full flow, or side stream configuration.

For sidestream applications, Evoqua recommends the following model selection for varying cooling tower systems.

Tower Tonnage	Flow M3/HR (GPM)	Skid Product Model
300	14-27 (63-120)	LCS-120
400	23-41 (100-180)	LCS-180
500	28-59 (125-260)	LCS-260
1000	43-78 (190-345)	LCS-340
1800	45-91 (200-400)	CTS-400
2300	83-159 (365-700)	CTS-700
3500	114-216 (500-950)	CTS-950
6000	182-363 (800-1600)	CTS-1600
8500	295-522 (1300-2300)	CTS-2300
12500	460-772 (2025-3400)	CTS-3400

*** Note Assumptions:** Flowrate 3 gpm per cooling tower ton (12,000 BTU/hr). Based on 3-5% recirculation range. If there is overlap between two models, we recommend selecting the larger model to ensure the best water quality can be achieved. All selections should be confirmed by an Evoqua application engineer.

TRANSFORMING
WATER
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LIFE



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