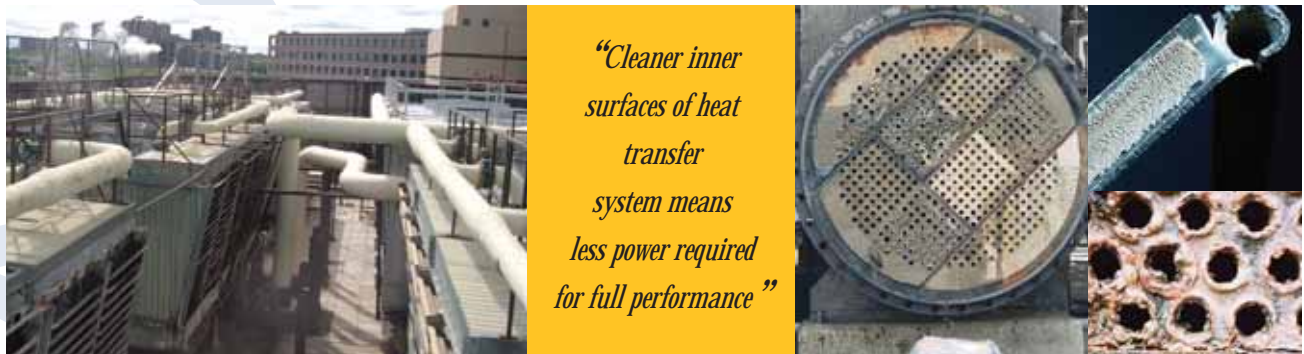


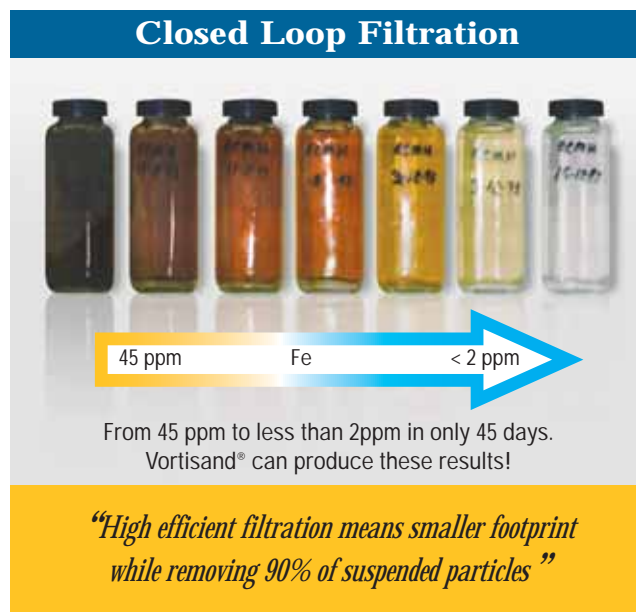
WHY REMOVE SUSPENDED SOLIDS SMALLER THAN 5.0 MICRONS?

Water from the cooling tower attracts and absorbs most dirt and airborne contaminants on a continuous basis. Our experience in filtering cooling water has shown that the majority of suspended solids in circulating cooling water loops are smaller than 5.0 micron in size mainly because of chemical dispersing agents that are designed to limit circulating dirt from agglomerating on heat exchange surfaces. In a perfect world this sounds good, but we do not live in a perfect world and **fine dirt does negatively affect heat exchange surfaces**. Conventional filters, strainers, and separators will not remove fine contaminants before they settle out in low flow areas, clog strainers, nozzles, and bio-fouled heat exchangers.

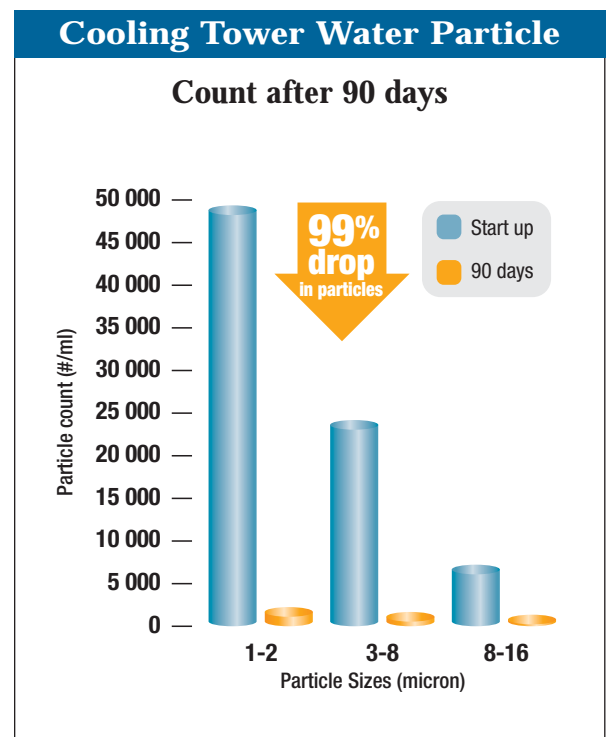
Continuous 0.45 micron filtration will remove suspended solids before they agglomerate and foul in your tower sump, cooling loop, and heat exchangers. Vortisand® provides **clean, clear water** when used in conjunction with chemical treatment programs that chemical treatment alone cannot guarantee. Therefore, you will **optimize your cooling system efficiency** with **optimal use of chemistry**. Don't get fooled into the sweep piping myth to clean your tower sumps.



The Cooling Tower Institute announced that biofilm has a greater insulating potential than mineral scale deposits (CTI, Paper No TP2329A) by as much as four times. Foulants in your cooling water system are in direct relation to increased energy cost and downtime. When deposits form on condenser tube walls, they increase fluids surface friction resistance, accelerate corrosion and impair heat transfer. **Control microbiological growth** by reducing the nutrient food source by greater than 90%, and eliminating solids that provide a protective environment, thereby **reducing the risk of Legionella outbreaks** with Vortisand®.



Open cooling tower loops typically show that most suspended solids are smaller than 5.0 micron. The following particle test was performed on a Vortisand® filter installed at a steel plant. Results show particle removal efficiency greater than 95% after 3 months.



CROSS FLOW FILTRATION + SAND... HOW DOES IT WORK?

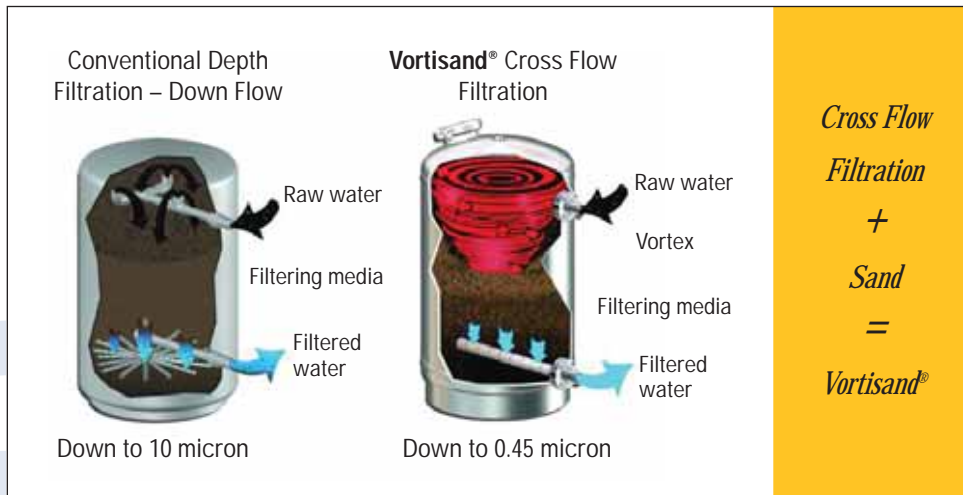
Vortisand®, is the pioneer in combining centrifugal separation (Vortex effect) and sand filtration. In fact, it uses a tangential spin across the sand to keep dirt from building up in the unit. Using centrifugal force above the multi-layered media helps to remove the suspended solids and significantly increases the effective filter surface within the tank.















The turbulence produces a sustained cleaning action that forces the suspended solids to accumulate near the inside walls of the tank. As a result, much finer sand can be used without clogging the media. The water, which is now largely free of impurities, is then filtered through the media and subsequently collected. Contaminants trapped above the sand are removed using an automatic backwash cycle which Vortisand®, requires less water and a shorter operating time than traditional sand filters. This process contributes to longer cycles and much finer filtration levels.

*“Do you know what’s
in your cooling water?
And what is it
costing you?
Find out by asking
for an
independent laser
particle analysis
(LPA) ”*

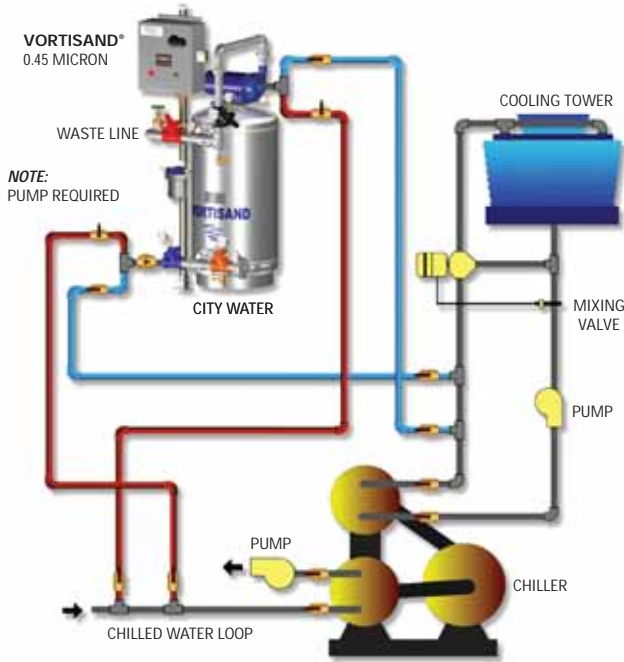
COMPARATIVE SAND FILTRATION METHODS



VORTISAND MORE THAN A HIGH EFFICIENCY 0.45 MICRON FILTER

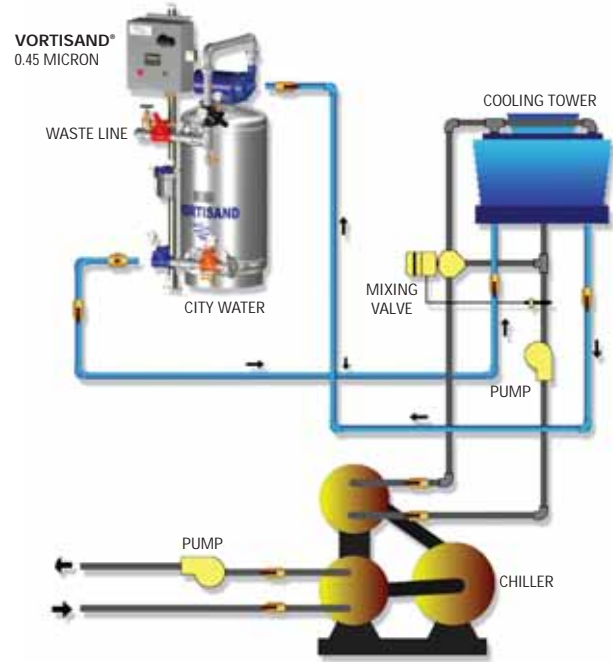
-  Compact system design
-  Designed for all flow rates
-  Easy to install in new or retrofit application
-  Minimum maintenance requirement
-  Low horsepower requirement on all filter pump selections
-  Operational cost savings up to 75% compared to conventional down flow media filter
-  Low backwash flow rates with adjustable time cycle (4 to 8 minutes)
-  Customized systems
-  Piping manifold assembly based upon applications
-  Fully automatic system with adjustable OIU settings
-  Permanent media
-  Visual detection of all control operation with state-of-the-art Operator Interface Unit (OIU)

**Standard Side Stream (Alternate)
Condenser and Chilled Water Loops**



Alternate Water Loop - Filter can be used on both open and closed loop systems. Primary filtration on cooling tower loop and secondary (alternate) filtration on closed loop when required.

**Side Stream — Cooling Tower Water
Basin to Basin**



Basin to Basin - Sump water intake and return. Our high efficiency design reduces the need for sweeper piping in tower sumps.

VORTISAND® is supplied in a wide variety of models constant or variable flow ranging from 20 gpm to several thousands gpm to offer **OPTIMUM SOLUTIONS**. Greater capacity filters are available on special orders. Pilot and/or rental units available upon request. VORTISAND® is fully warranted.

CHARACTERISTICS

Model	Filtration flow rate (GPM)	Flow required for BW per vessel for 8 min	VESSELS		Approx. Space required ¹ (L x H x D)	Motor (HP)	Piping conn. (IN)	Approx. weight (lbs)
			Number of vessels	Dimensions (DIAM x H)				
AWT1-12	20 GPM	12	1	12 x 30	2'9" x 4'6" x 2'3"	1/2	1"	450 lbs
AWT1-20	60 GPM	35	1	20 x 42	2'7" x 5'6" x 3'0"	1	1 1/2 "	1 000 lbs
AWT1-24	75 GPM	40	1	24 x 48	3'0" x 5'9" x 3'6"	1 1/2	2"	1 650 lbs
AWT1-30	100 GPM	50	1	30 x 55	3'3" x 6'3" x 4'0"	2	2"	2 500 lbs
AWT1-36	140 GPM	70	1	36 x 60	3'7" x 7'0" x 4'6"	3	3"	4 100 lbs
AWT2-30	200 GPM	50	2	30 x 55	7'11" x 6'3" x 4'0"	5	3"	5 000 lbs
AWT2-36	280 GPM	70	2	36 x 60	9'3" x 7'0" x 4'6"	7 1/2	4"	8 000 lbs
AWT3-30	300 GPM	50	3	30 x 55	11'2" x 6'3" x 4'0"	7 1/2	4"	7 500 lbs
AWT4-30	400 GPM	50	4	30 x 55	13'10" x 6'3" x 4'0"	10	4"	10 000 lbs
AWT5-30	500 GPM	70	5	30 x 55	16'7" x 6'3" x 4'0"	10	6"	12 500 lbs

⁽¹⁾ All dimensions are approximate and may vary at fabrication. Metric conversion table available upon request.



A WISE COST-EFFECTIVE SOLUTION

Efficient Ultra-Fine Filtration

Vortisand® systems have proven themselves for more than 25 years on a worldwide basis and are the result of many years of research and development. Designed for 0.45 micron filtration, these high efficient filters provide a filtration that is 10 to 20 times finer than that of conventional filters and remove more than 90% of suspended particles found in the recirculation water.

A System That Fits Your Needs

Recirculation flow, airborne contamination source, volume of water, make-up water quality... all these operation parameters are considered in sizing the proper filter to your cooling water. Each Vortisand® filtration system offers the best solution that will truly fit your needs and provide clean, clear water, 100% of the time even when the cooling demand is at its peak.









“The key to clean cooling tower water is ultra-fine filtration... Vortisand® provides it.”



“Ensures permanent comfort for building occupants with proper cooling and heating.”

A Top Notch Quality System

Vortisand® filters are renowned for their high quality standards

-  304 Stainless vessels
-  ASME construction
-  TEFC Motors
-  NEMA 4X Control Panels
-  Certified Control Panels
-  PLC and Operator Interface Unit



“Vortisand®, provides short payback time typically within the first 12 months”



VORTISAND®: For Short Payback Time

Up to 10% energy savings by increasing heat efficiency – Savings are generated by preventing the formation of sediments and insulating layers for a greater heat exchange efficiency.

Reduced maintenance costs by reducing periodic clean ups – Decrease the costs associated with cleaning heat exchangers, coils, valves, strainers, condenser tubes, tower basins and other components in the cooling loop.

Optimal chemical treatment with up to 20% chemical reduction – Vortisand® significantly improves the effectiveness of chemicals by reducing the Total Suspended Solids (TSS) found in cooling water systems. The use of biocides and corrosion inhibitors become more effective by reducing the suspended solid load.

Reduce downtime production losses by providing the cleanest filtered water – Vortisand® will decrease the frequency of downtime and replacement of equipment.

Water savings generated by using less water for backwash – Up to 80% less backwash required since most particles are trapped on the upper section of the filter, backwash water requirement is minimized.