

USING AN ADVANCED FILTRATION SYSTEM, A FIVE-STAR HOTEL OVERCOMES COOLING TOWER SLUDGE ISSUES AND EARNS A PAYLOAD OF COST AND EFFICIENCY BENEFITS IN THE BARGAIN.



The Mandarin Oriental, Washington D. C., is a five-star luxury hotel with more than four hundred rooms, an award-winning restaurant and other amenities reminiscent of the finest hospitality traditions of The Far East. The Mandarin's D.C. location, and top drawer service offering has helped earned the hotel an international reputation for high quality. A sampling of recent guests include the iconic Sixties rock band, The Rolling Stones, U.S. Presidential hopeful, Barak Obama and many other media celebrities and political dignitaries from around the world.

Not long ago, the hotel was confronted with a major cooling tower sludge problem. Massive amounts of the nasty stuff were detected in the chiller tubes, and the 12-inch system feeder pipe as well. The filtering apparatus on line proved ineffective at combating the problem, prompting management to seek out expert consultation.

Team Effort

Patrick Payne of Boland Trane teamed up with Denny Alexander of Armstrong Filtration (provider of cost-effective filtration solutions based in Winchester, VA), to conduct a scientific examination of the hotel's cooling water system. Both companies have been bringing innovative products and services to their clients since the early 1960's.

" We collected water samples from the hotel's cooling water system and forwarded them to an independent laboratory for laser particle distribution testing. This lab analysis

determines the micron size dispersion and dirt load concentration per each micron size from 100 to 0.45 sub micron range" recalls Denny Alexander. The results were quite revealing. Roughly 95% of the particles were under 20 microns. The findings narrowed the field, as far as filtration solutions went. Many types of filtration systems previously considered were automatically ruled out. The only one that met all the criterion we were looking for turned out to be the Sonitec's Vortisand® filter."

The Next Generation

Vortisand® is a successful concept years ahead of its time. One might even call it The Next Generation of sand filtration systems.

The process works as follows.

Once solid materials are centrifugally-directed to a filter tank's outer radius, they are sent on their way via a self-activating backwash. This advanced approach to filtration facilitates the use of extremely fine media capable of capturing particles as small as 0.45 microns. Run of the mill filters simply can't compete, as near-microscopic solids can slip right through them like minnows through a fishnet. This is due in large part to the not-so-fine media conventional

systems must employ, as very fine media can prove as much a clogging agent as the solids it is intended to trap. The unique operational scheme employed by Vortisand® renders this potential problem no problem at all.

"The Vortisand® filtration system traps suspended solids on top of the media bed, and not back into the condenser water loop," explains Mandarin Oriental Director of Engineering, David Tolson. "The really great thing about the Vortisand® is its ability to self-monitor sand cleanliness, and self-clean as needed. The moment we get a 10 to 12 PSI difference between incoming flow and outgoing, the Vortisand® back-washes automatically. And because we have two filtration systems in operation simultaneously, one filter picks up the slack when the other is in backwash mode. It's a really smart concept."

R.O.I. Right Now

According to Boland and Armstrong's energy analysis, the Mandarin had earned return on investment within a twelve month period using the Vortisand® filtration system. A water sampling taken shortly after installation corroborated this optimistic forecast, as it showed a 99% suspended solid reduction. Operational efficiency was much-enhanced as well, as the hotel's cooling tower now consumes much less in the way of electrical amperage and chemistry.

"The hotel doesn't consume nearly as much cooling tower chemistry now because the Vortisand® has made the water much cleaner," explains Mandarin Oriental Group Energy Manager, Kevin Sharp. "We're now realizing a roughly 45% savings on chemistry verses the amount we spent, pre-installment. Water usage has gone down substantially as well. We've enjoyed a 35% use reduction over last year, the majority of the savings occurring since the Vortisand® system has been on line."





Numbers don't lie. According to Sharp, cooling tower water usage for January 2007 was one million, fifty seven thousand gallons. It year later it was a mere nine hundred thousand gallons, and by February '08 a little more than a hundred thousand gallons less than that. March saw a big drop as well, as have all months that have followed since the Vortisand® came on board.

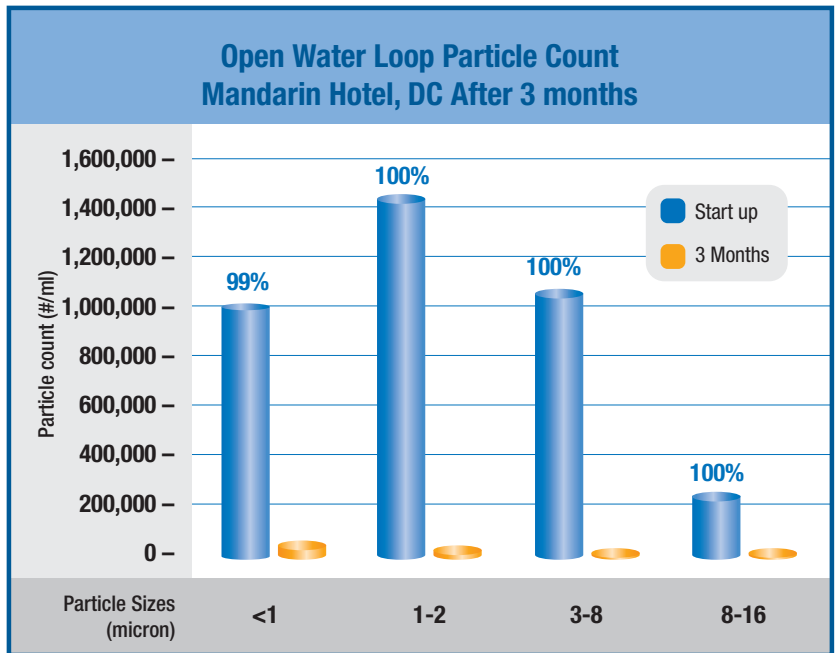
"At the moment we're using roughly half the water we used a year ago, and probably several years before that," Sharp adds. "We've gained a very hefty savings, and it's doubtful we'd have done that well without the Vortisand®."

Salvaging Efficiency

One of the biggest paybacks earned by Mandarin via the Vortisand® installation has been a huge increase in cooling tower operational efficiency. According to Tolson, the hotel's original filtration system used cyclonic separators to dissolve solids into microns. The system was problematic efficiency-wise, as the filtering process pulled water away from the tower, reducing the cooling effect.

"We wound up sacrificing five percent of our efficiency to our old cooling system," he remembers. "The cyclone channelled water away from the system, put it through a filter and then returned it. And the cyclone still didn't filter very well. Vortisand® has efficiency built into its design. A filter pump replaces filtered cooling water on a simultaneous basis, stealing away none of the cooling effect. When Boland/Armstrong conducted their initial testing, the system showed something like 0.45 micron solids present. That figure went down to 0.1 micron once the Vortisand® was installed (which in terms of water cleanliness is nearly crystal-clear). When clean water goes to the chiller, heat transfer doesn't have to be negated and you get 98-99% efficiency. So the upshot here it that you don't lose efficiency with Vortisand®. You gain."

PERFORMANCE DATA			
PROJECT:	MANDARIN HOTEL		
LOCATION:	WASHINGTON , D.C.		
FILTER MODEL	MODEL AWT2-30-SP (200 GPM) USMR769		
	COOLING TOWER LOOP		
SIZE RANGES MICRONS	5/4/2007	8/22/2007	REMOVAL EFFICIENCY
< 1	1,081,679	9,285	99%
1-2 Sub-Total	1,482,878	922	100%
3-8 Sub-Total	972,516	330	100%
8-16 Sub-Total	328,893	59	100%
TOTAL COUNT	4,011,902	10,605	100%
T.S.S. (PPM)	1,651.00	0.03	100%



Printed in Canada



For more information on the Vortisand® filters contact Sonitec at:
1-888-876-9655
 or visit the website:
www.vortisand.com