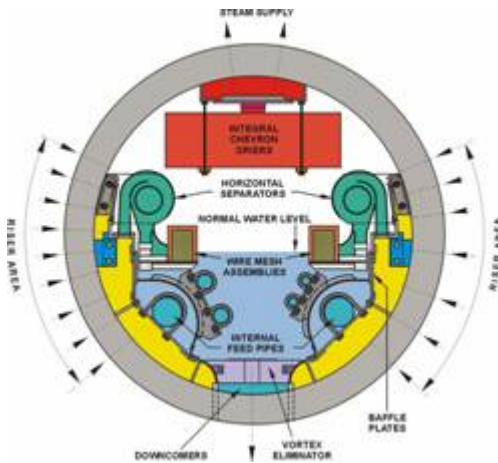


Boiler Treatment



Whenever water is heated or steam is generated, the minerals and chemicals contained in the water supply, cause operational problems by depositing as scale or by forming incondensable gases. Even in pure water or condensate, chemical interactions occur between the boiler walls and the surface of the water, as it changes into steam causing oxygen attack in the boiling vessel. For many years boiler manufacturers and operators have been looking for solutions to these problems and with the advent of Hydrosmart technology, that solution has become available.

As Hydrosmart was originally developed to resolve severe corrosion problems in high temperature water, it has no trouble in preventing the chemical interactions that facilitate scale formation and oxygen attack. The resonance frequencies progressively break down and remove any existing scale deposits and allow the boiler to regain its original thermal efficiency. The entire boiler circuit is now operating in a non-corrosive soft water environment and surface tension is significantly reduced. Pumps will no longer cavitate, valves and seals perform optimally, sensors will read accurately and energy requirements are kept at minimum levels.

Any filtration system larger than 4 microns will be flushed out (i.e. filters will not need replacing). As no scale will be forming on the boiler surfaces, efficiency will be maintained at optimum levels throughout. 'Blow-downs' will be only required to reduce excessive TDS levels that have built up after long periods of operation. Consequently, the only downtime required will be for boiler inspections or to effect repairs of a mechanical nature.

Boiler Test Results and Feedback

Since the technology was introduced into the market place, Hydrosmart has been treating a wide variety of boilers applications, from large steam generating boilers situated in hospitals, hotels and food processing plants, to specialist sterilising boilers for surgeries and clinics.



The hardest part of applying this technology was persuading boiler engineers to turn off the chemical water treatments. As the results were so impressive, the boiler engineers found they could then apply the treatment technology to other parts of the operation. An email from the Chief Engineer at the Sanghla Hospital in Bali to our agent is typical of the feedback we get after applying Hydrosmart treatment.

Email – received from Chief Engineer - Sanghla Hospital - Denpasar - Bali

2nd May 2003

Attn: Mr Henry Tan

AsPac Global Resource Pte Ltd

10, Eastwood Road, #03-18

Singapore 486364

Re: Boiler treatment by Hydrosmart

Dear Mr. Henry Tan

Herewith I would like to inform you briefly about the Hydrosmart system after we apply it since one month ago for our two unit boiler system, at Sanglah General Hospital, Denpasar:

First: Our Boilers Problems:

Our hospital uses well, (bore), water for supply to two boilers (capacity 650 kg and 300 kg). The content of scale/ lime agent of this water are very high and has very frequently blocked the pipes and holes in the system and caused the pressure (on the pressure gauge) to reach 10 bars. (normal pressure is 4-5 bar)

This situation effects to a consequence of explosion risk and is wasting diesel oil.

Application of chemical agents to the system to eliminate the scale is not effective.

We have had to clean, (de-scaling) the cylinder of each boiler every 4-6 months, to overcome the above problems until we try to apply Hydrosmart to this system.

Second: Result:

Installation of one unit Hydrosmart system on water supply pipe (March 25, 2003)

Blowdown of each boiler, about every once every 3 hours. Blowdown water is clearer than before.

Blowdown reduced from 90seconds to 15seconds every 3 hours.

Cleaning schedule done for 300 kg capacity boiler on April 27, 2003: only little scale found, far different from that we found before.

We are still watching the other changes with the system and we do hope Hydrosmart will not stop here to correct our boiler system

I hope this information will be helpful for you. Please visit our hospital again; whenever you come to Bali, I plan to apply one more unit at CSSD emergency unit.

Best regards,

*S u h a r t o n o
Chief Engineer
Sanglah General Hospital
Denpasar, Bali.*

Even though English is not Mr.Suhartono's first language, the message is perfectly clear, the treatment works. Six weeks later a Hydrosmart unit was fitted to the Sanghla Hospital's CSSD (Central Sterilizing Supply Department) The latest email, from our agent - ASPAC Global Resources Pty Ltd is even more impressive.

*From: "Henry Tan" <henrytan@aspacgr.com>
To: "John Johnson" <hydro@senet.com.au>; "Aqua Co" <aquaco@senet.com.au>
Subject: Sanglah's boiler
Date: Wednesday, 17 September 2003 1:08 AM*

Hi JJ,

Thanks for the reply on the Ritz Carlton set up. I had a very exciting week in Bali before returning to JKT to meet my family.

The highlight of the trip probably comes from Sanglah Hospital when I made a service call. The laundry machine and dishwasher that uses steam generated from the boiler treated by Hydrosmart has been de-scaled!

This news comes from the operator of the laundry system. I then saw the condition of the dishwasher, in the (kitchen), I was amazed and dumbfounded. I will capture them on J-pegs next time and I have also requested the CE to write a testimonial on this and of course we will be too happy to share it with you.

Thanks for the great technology and the chance to be part of it.

*Cheers!
Henry Tan
AsPac Global Resource Pte Ltd*

The information contained in the second email from ASPAC Global Resources is truly remarkable, because it confirms earlier indications that the Hydrosmart resonance frequencies remain intact in the steam and the condensate. These are steam-generating boilers and are de-scaling the equipment that uses steam from the treated boilers, i.e. the laundry washing machines and the kitchen dishwasher.

In the same email, is a quote from Jye West, the Engineering Director for the Grand Hyatt Nusa Dua, Bali, who is responsible for all the Indonesian hotels in the Hyatt International

Group. He successfully applied Hydrosmart technology to the three main Grand Hyatt cooling towers last year and to two of the Grand Hyatt's swimming pools.

Hydrosmart removed 4.5 tons of scale from these three towers, returning them to maximum efficiency and saving US\$ 350,000 in media replacement costs. These 3 towers now run at maximum efficiency without any algaecide, biocide or de-scaling chemicals. In the 2 swimming pools where Hydrosmart has been installed, the chlorine dosing has dropped from 8 kgs per day to 1.5 kgs per day (a 75% saving). The water is soft, the algae have gone, the tiles are easy to clean and there is no chlorine smell.

Here is what Jye West had to say to his counterpart in the Hyatt Regency Hotel in Jakarta when asked for advice on Hydrosmart treatment.

“This technology works, but you have to be patient if you are not achieving the results. Don't blame the technology, but think operationally and logically what has gone wrong in the installation.”

The EMF Issue

In order to achieve resonance at the electron level, Hydrosmart frequencies have to be extremely accurate and this is why a computer is used. Strong electromagnetic fields from equipment such as pump motors, transformers, generating sets or mains power cables which run alongside the treated water pipe, may distort the frequencies and render the treatment ineffective. It is therefore important to assess the extent of all electromagnetic fields and install the Hydrosmart units after pump motors and away from power cables and other electrical equipment that emit strong electro-magnetic fields. In cases where EMF's are excessive, shielding or shielded cable may have to be used and pipes relocated approximately a metre away from power cables.

Following is an interview with Gary Tucker, NSW State Manager for

Getinge Australia Pty Ltd.

Unit 4 /20–30 Stubbs Street,
Silverwater, NSW,
2128, Australia.

Gary's company manufactures sterilisation and disinfectant equipment that use boilers to supply steam to this equipment in the Central Sterilizing Supply Departments of hospitals. Gary was introduced to Hydrosmart by John O'Hare the South Australian Manager for Getinge, who had installed it on his sterilizing equipment in several Hospitals and Clinics in Adelaide.

Gary has been monitoring the performance of Hydrosmart systems installed to protect and de-scale his sterilising boilers and is currently recommending the Hydrosmart technology for use in many hospitals in New South Wales and throughout Australia. He sees Hydrosmart as an enhancement of his product, by making them work more efficiently as well as delivering substantial and sustainable cost savings for hospitals, by reducing maintenance, chemical and energy requirements. Next Gary talks about what he has found!

Q: Does the HYDROSMART Water Conditioner cause any changes in the TDS (Total dissolved solids), readings of the boilers?

A: When the water supply line to an existing boiler was treated by the Hydrosmart system the TDS readings fell. This is because no large-scale deposits were allowed to form on the internals of the boiler. In electric generators if you don't form scale in the boiler you will not create foaming in the water. This is ideal because foaming in the boiler causes wet steam, which can be drawn off to the sterilizers creating wet loads. In the past we have treated the boiler with chemicals to stop scale build up. However, with the Hydrosmart system, this treats the water without any chemicals being required.

Q: Do chemicals cause any problems?

A: Yes, several things happen. As you use chemicals to work on your TDS level the chemical gives off incondensable gases and these gases go through the pipework. As this gas is at a lower temperature than the steam and has no moisture content this can create further wetting of the steam, with the great possibility of the gas forming around an item in the sterilizer and rendering it unsterile.

Q: How does HYDROSMART help?

A: With the Hydrosmart water conditioning system it is not necessary to use chemicals for boiler treatment. It is much easier because there will not be any scale prevalent in the boiler to create foam and as there are no chemicals required for use, there will be no incondensable gases formed. As you say the only scale allowed to form is up to 4 microns in size. As this would not be of any weight it would be easily removed when the boiler is blown down. Also as your water feedline is being treated this line is kept clear saving possible pump problems from occurring. It also means the probe pockets remain clear and do not get blocked up with scale, thus saving further maintenance.

Q: Does the scale affect the probe readings?

A: Yes if the scale gets around the float of the probe it can't sense if the water is there, giving the possibility of burning out your elements. The critical factor is to keep this clean. In the old days we went to treatment but now this shouldn't be necessary. I am very confident with what we have seen so far. At one of our installations we saw on an existing steam generator that had a 7 year build up of scale. After fitting Hydrosmart, we saw dramatic shifts, up and down, of the TDS levels, as the sheets of the existing scale, lifted off the insides of the boiler.

This scale build up was impregnated with excessive chemical treatment. This was the reason for the varying TDS levels. We also found a considerable amount of incondensable gases was being let off by this impregnated scale. This showed that the Hydrosmart unit worked very well on existing installations as it immediately started to clean up and remove the scale already formed and does not allow any to reform.

Q: Is it cost saving?

A: Most definitely. Chemicals will no longer have to be used for descaling and downtime and maintenance costs will be dramatically reduced.

Q: Have you had any other feedback?

A: Hospitals who have seen the results of Hydrosmart are now extremely active in looking at what we've found. We are looking very closely at the downside, but we haven't found one!! We want to check that the treated water doesn't attack anything inside the generator or plant equipment. So far it hasn't. (End of Interview)

Lautoka Hospital Boiler Water Test Record

Sainsbury Boiler, 10,000 lbs per hr. 5000 litres per hr.

Boiler Engineer Vijay Kumar

	P1 Phenophaline. Alkalinity 500-700 ppm	P2 Hydrate Alkalinity 300-500 ppm	TDS 1000-1500 ppm	Phosphate 30-50 ppm	Sulphite 20-100 ppm
8-May-98	660	560	1300	60	30
10-May-98	680	560	1600	100	60
11-May-98	680	620	1800	100	25
12-May-98	640	600	1500	100	18
12-May-98	560	540	1400	100	20
12-May-98	1430 pm HYDROSMART UNIT FITTED TO BOILER FEEDLINE				
13-May-98	600	560	1200	100	10
14-May-98	560	460	1100	75	15
15-May-98	CHEMICAL DOSING PUMP SWITCHED OFF				
16-May-98	420	400	800	40	15
19-May-98	320	300	630	45	15
20-May-98	300	280	570	40	25
21-May-98	300	260	500	30	35
27-May-98	Readings jumped due to chemicals tests reacting with removed scale				
27-May-98	420	500	1100	30	20
28-May-98	390	450	900	30	20
1-Jun-98	200	180	500	30	Less than 10
7-Jun-98	120	200	150	30	Less than 10
9-Jun-98	100	80	200	30	Less than 10
10-Jun-98	100	80	150	30	Less than 10
11-Jun-98	60	80	150	20	Less than 10
12-Jun-98	80	60	150	10	Less than 10
13-Jun-98	60	60	150	10	5
18-Jun-98	60	80	200	5	10
22-Jun-98	600	800	800	10	10
25-Jun-98	700	600	900	10	7.5
30-Jun-98	680	680	600	10	10
1-Jul-98	60	60	200	10	2.5
2-Jul-98	80	80	250	10	2.5
7-Jul-98	60	80	250	10	2.5

The above data shows the chemical testing of the boiler water prior to and 2 months after applying Hydrosmart treatment to the boiler feed water at the Lautoka Hospital on 12th of May 1998. It shows dramatically reduced readings across the whole range of tests after applying Hydrosmart treatment. This is because chemical testing agents need to bond or react with the minerals in the water in order to get a reading. Hydrosmart resonance frequencies have disrupted the electron polarity of both the minerals and the testing chemicals and prevented them from reacting. Readings jump again on the 27th of May and on the 22nd of June when large amounts of scale fell off the internal surfaces of the boilers and bonds became available for the chemicals to react with. The data illustrates the reduction in chemical activity that results from Hydrosmart treatment.