The Electronic Anti-Scale System

Cooling Tower Information

CWT
Christiani
Wassertechnik

EN - 08/2014

Vulcan Cooling Tower Information

MADE IN GERMANY

Kitchen of Spokane School

USA

International Water Treatment NA LLC
2607 Bridgeport Way W Ste.1J
University Place,WA 98466
www.iwtna.com

Vulcan in a School Kitchen

Dear CWT Team,

The steam convection oven has greatly improved since the installation of the Vulcan. The water is injected via the pipe in the centre of the heating coils and a fan inside the coils blows the water through the coils and comes out as steam. The operating temperature of this device is 350F. The white material you see on the coils is a powder coating that is easily removed with a wet cloth. No more chemicals are required to clean the convection oven.

However, we have noticed even greater results in the school kitchen, which was previously using a traditional water softening system. But all in all, we can confirm the effectiveness of the Vulcan treatment, which means less work for the maintenance staff.

The Vulcan unit installed on the entire building system has also been extremely effective. No more rusty water after weekends and Christmas break. The next Vulcan will be installed on the other school buildings, which are around 20 – 25 years old.

The last Vulcan unit is installed on the main cooling tower – we have had nothing but positive news in regards to this installation. We will be seeing more orders coming from this customer very soon.

Best Regards
Arne Vestad

Commercial Cold Storage

USA

Commercial Cold Storage

1011 S 1st St,
Mt Vernon
WA 98273
USA

IWTNA
2607 Bridgeport Way West
Suite 1J University Place
WA 98466

Dear IWTNA,

Please find below the installation photos of the Vulcan S100 installed on the main line connected to 3 cooling towers.

Regards,

The Mt.Vernon Cold Storage Team

www.commercialcold.com

Vulcan S100 installed on cooling towers

Vulcan S100 installed outside

Neptune Foods Restaurant

USA

Vulcan installed at:
Neptune Foods - Vernon
Seafood processing
90058 Vernon
California, USA

Arne Vestad - International Water Treatment North America

Dear CWT Team,

This cooling tower is one of three protected by the Vulcan S25 units in this location. The building is one of 47 buildings owned by Neptune Foods in Vernon LA, and this particular building does mainly seafood processing and packaging for consumers.

This picture was taken after 4 months the installation of the Vulcan S25. The tower was dirty/not cleaned before the Vulcan was installed.

Since the Vulcan installation, the cooling towers have been scale free and there has been no need for any chemical treatment.

Clean cooling tower after using Vulcan

Best Regards,
Arne Vestad

Spokane Public Schools Washington

USA

Vulcan installed in

Spokane Public Schools

Dear CWT Team,

Spokane schools now have 6 Vulcan units installed.

One of the first Vulcan units is on a small cooling tower and this stays absolutely clean during the season. The tower was full of scale when we started and after 4 weeks, scale started to fall of in big chunks and now it is completely scale free.

Installation of Vulcan Descaler for the entire buildings water supply in the Roosevelt school

Our first installation in Spokane schools was in Shaw Middle School, 50 years old building and with rusty/dirty looking water.

This was installed before the school started in the fall of 2011.
After Christmas this year, the water is always clean and the janitor does not have to flush the piping anymore.

Have a great day.
Arne Vestad
IWTNA

Installation locations

Roosevelt Elementary School
333 West 14th Ave
Spokane, WA 99204-3627
USA

Shaw Middle School
4106 N. Cook St.
Spokane, WA 99207
USA

Energetika Ravne d.o.o Heat Exchanger

Slovenia

ENERGETIKA RAVNE, d.o.o.

Ravne, July 4th 2000
RP 12.00/1029/RJ

SUBJECT: INSPECTION OF TUBE HEAT EXCHANGER (2X) UHP FURNACE, OPEN SYSTEM 40/30 °C

Upon the agreement with Mr Petovar, we have concluded to inspect both tube heat exchangers on the secondary part of the UHP furnace on Tuesday, July 4th 2000. The front and rear covers of both exchangers shall be disassembled.

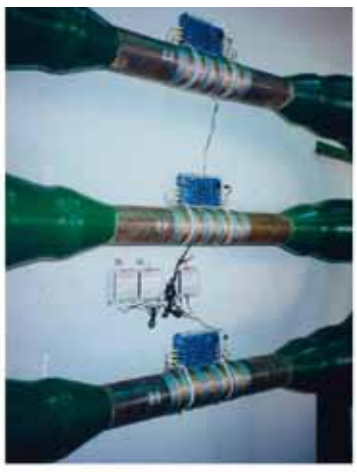
PRESENT AT INSPECTION:
Petovar – SŽ Metal Ravne, d.o.o. JUH OTO
Oderlap, Vučko, Potočnik, Jamšek, Zapušek – Energetika Ravne, d.o.o.

ESTABLISHMENTS:
The inspected tubes were clean; there were no signs of lime scale accumulation.

The device for electronic softening is functioning well.

CONCLUSION:
We suggest that the device is purchased.

ENERGETIKA RAVNE d.o.o.
RAVNE NA KOROŠKEM



After Vulcan installation

Control of honey comb fill of cooling tower

Cooling Tower - Chiller

USA

INTERNATIONAL WATER TREATMENT
NORTH AMERICA
Clean, Green, Affordable

Vulcan installed in a Chiller

Dear CWT Team,

Here are two pictures from a Chiller opened for a routine cleaning, but nothing to clean after two years with Vulcan treatment.

No scale formation after using Vulcan

This Chiller is connected to a Cooling Tower which is exposed to lots of air borne contamination from surrounding farms.

Best Regards

Arne Vestad
www.IWTNA.com

Dynamit Nobel

Germany

Dynamit Nobel

AKTIENGESELLSCHAFT

WERK LÜLSDORF

DYNAMIT NOBEL AG, Werk Lülsdorf, 5216 Niederkassel

Firma
Christiani Wassertechnik GmbH
Diepenbenden 25
5100 Aachen

Water treatment device

Dear CWT-team

Currently we have five devices from the Vulcan range in use.

Because of the high degree of hardness of our cooling tower water, we had to decalcify every few months. After we used the devices, the scale on the heat exchange pipes was drastically reduced. Thus the lifetime of these devices is getting longer.

Kind regards

DYNAMIT NOBEL AG
Werk Lülsdorf
Technical Department

Physical Water Treatment as the Solution for Cooling Towers

Japan

Test report on Vulcans (pulsed water treatment systems) installed as a preventive measure against scale buildups causing faulty of the cooling towers

February 24, 2007

Tested field: Factory of a pharmaceutical company
Installation sites: Cooling towers on the rooftop of the second building
2-1 cooling tower **A**: Makeup water piping size is 50A.
2-2 cooling tower **B**: Makeup water piping size is 50A.
1 cooling tower **C**: Makeup water piping size is 50A and circulating piping size is 80A.

Model installed:
Vulcan S25
(water treatment capacity: 25 m3/hour)

Date installed:
For the cooling towers A, B, and C: July 22, 2006
For the cooling tower C: October 6, 2006

Vulcan installed on the makeup water piping (50A)

Used for cooling towers A, B and C

Vulcan installed on the circulating piping (80A)

Used for the cooling towers C

Objectives:
1 To prevent scale buildups on the cooling towers.
2 To reduce chemicals used for water treatment
(measure for complying with ISO 14001)
3 To save the energy cost by preventing the deterioration of the heat exchange effectiveness

Verification of the effectiveness:
After installation of the Vulcans, the statuses of the cooling towers A, B, and C were inspected without using any water treatment chemicals. Even after elapse of approximately six months, almost no scale buildups were observed inside the refrigerators and the heat exchanger tubes, and no water pollution warning was displayed. (Usually, without water treatment chemicals, the water quality is deteriorated and water pollution warning is displayed.) Silica adhered on the cooling towers was easily removed with a finger touch. With these results, the effectiveness of the installation of the Vulcans could be confirmed.

Remarks (Summary)
The water treatment system, Vulcan, has the following features: (For details, refer to the brochure attached.)
Vulcan changes only the crystal structure of scales without changing the quality of water. Therefore, nothing is added or reduced to or from the ingredients of water. The water through Vulcan is soft and has an increased permeability. Vulcan makes city water to drinking water and can be used as better cooling water.
(*) The effectiveness of the water treatment in the water supply line will last for 48 hours and for approximately 2 km in distance.

Major features include:
- Prevents buildups of rusts and scales
- Makes cleaning in the kitchen and bathroom much easier (toilets, showers, tiles, joints, etc.)
- Drastically reduces the clogging due to oil balls
- Eliminates the necessity of strong chemicals for removing scales.
- Eliminates the necessity of additives.
- Does not change the water quality.
- Prevents the clogging at the time of drainage

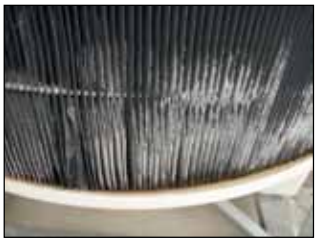
Test report on Vulcans (pulsed water treatment systems) installed as a preventive measure against scale buildups causing faulty of the cooling towers

Cooling Tower A Cooling Tower B

Cooling Tower C

Developments after installation of the Vulcan

Adhesion of silicia six month after the installation of the Vulcan



water is hosed

after the hosing

Silica is not removed by hosing, but can be pealed off with a nail.

Silica is removed by simply hosing the water. (The remaining silica is pealed off with a touch of a finger.)

The installation of the Vulcan in the circulation line seems to create the status equivalent to the cooling tower C.

Water quality tests on the cooling tower C

Quality tests of three types of water approximately six months after the installation of the Vulcan:
(1) Makeup water
(2) Circulating water
(3) Makeup water (raw water)

Data and Observations of the Effects of the Vulcan Electronic Descaler on Cooling Towers

August 21, 2013

Installation site:
The unit was installed on the 10 inch diameter line that feeds twin cooling towers (CT-1 and CT-2) at the FAMU/FSU College of Engineering.

Model installed:
Vulcan S250

Date installed:
July 16, 2013

Objectives:
The objectives are to prevent scale buildup on the cooling towers, remove the existing scale, eliminate the need for chemicals or time-consuming cleaning procedures, and to reduce energy costs.

History:
The maintenance for these cooling towers previously involved continuous injection of descaling chemical cleansers. The use of these cleansers was discontinued over a year prior to the installation of the Vulcan. In that time, the cooling tower flutes became encrusted with both scale and biofilm. Throughout the time period described below, there were no cleaning procedures in place with these cooling towers besides the treatment provided by the Vulcan.

Observations over time after the Vulcan Installation:

Between the time of the installation on July 16th and examination on August 1st, the green biofilm had begun to recede and gradually disappear. The next visit was about 3 weeks after the installation, on August 9th. At that point, the green biofilm had been further reduced and the scale deposits had begun to separate from the flutes in coin-sized flakes.

By August 20th, about a month after installation, the green biofilm had almost completely disappeared from the surfaces in contact with the Vulcan-treated water. The flakes of scale previously observed had fallen off in most places. The cooling tower flute surface area covered with scale deposits had been decreased by over 60%.

We are very optimistic about continued improvement with this application. In addition to these observations, water quality measurements were also obtained from each cooling tower and are summarized in the following charts.

Data and Observations of the Effects of the Vulcan Electronic Descaler on Cooling Towers

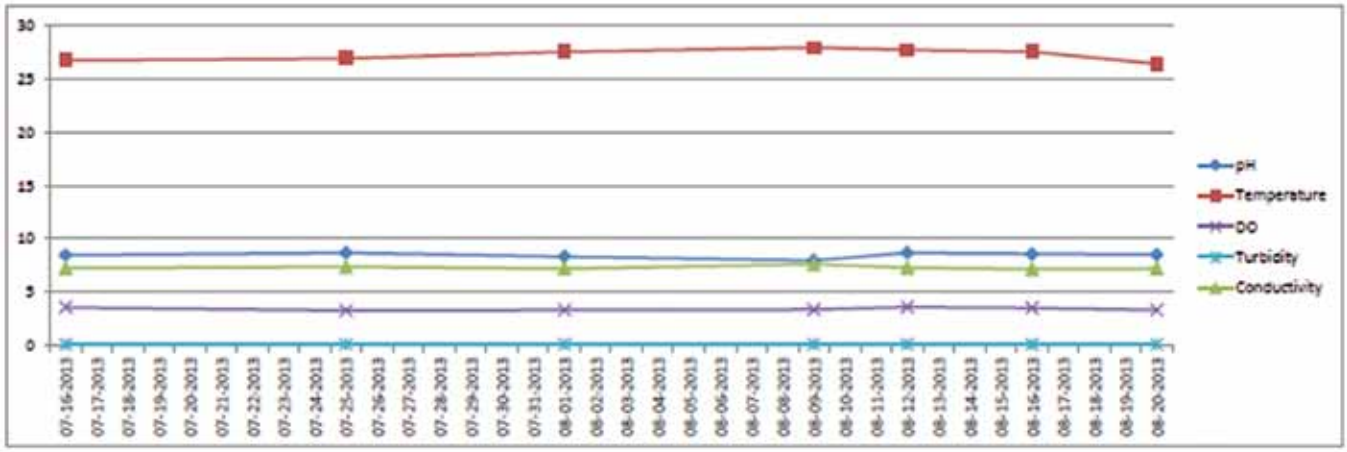
August 21, 2013

The Vulcan does not change the water quality beyond its affect on its propensity to cause scale buildup. As illustrated below, the pH, conductivity, dissolved oxygen level, and turbidity remained relatively constant during observation from before the installation to over a month after. Temperature is included, because of its affect on the other measurements and seems to correlate with the slight fluctuations observed.

Cooling Tower 1 Basin

	Date	pH (SU)	Temperature (°C)	Conductivity (umhos/cm) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Before Vulcan -->	07-16-2013	8.46	26.7	7.22	3.56	0.1
After Vulcan -->	07-25-2013	8.67	26.9	7.35	3.26	0.1
	08-01-2013	8.32	27.5	7.2	3.33	0.1
	08-09-2013	7.97	27.9	7.59	3.36	0.1
	08-12-2013	8.67	27.7	7.29	3.6	0.1
	08-16-2013	8.56	27.5	7.16	3.52	0.1
	08-20-2013	8.47	26.4	7.2	3.31	0.1

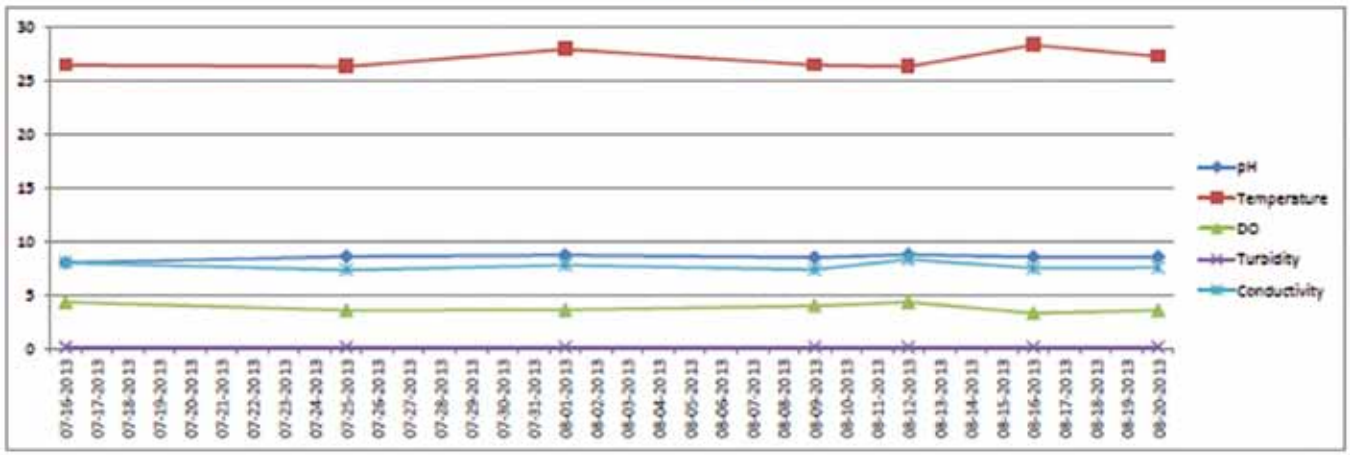
* divided by 100 to fit within the chart scale



Cooling Tower 2 Basin

	Date	pH (SU)	Temperature (°C)	Conductivity (umhos/cm) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Before Vulcan -->	07-16-2013	7.97	26.4	7.96	4.3	0.1
After Vulcan -->	07-25-2013	8.56	26.3	7.29	3.52	0.1
	08-01-2013	8.67	27.9	7.76	3.56	0.1
	08-09-2013	8.44	26.4	7.35	3.96	0.1
	08-12-2013	8.73	26.3	8.28	4.3	0.1
	08-16-2013	8.5	28.3	7.46	3.26	0.1
	08-20-2013	8.52	27.2	7.53	3.52	0.1

* divided by 100 to fit within the chart scale



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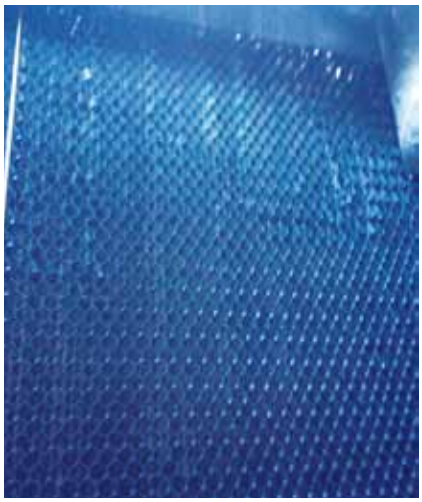
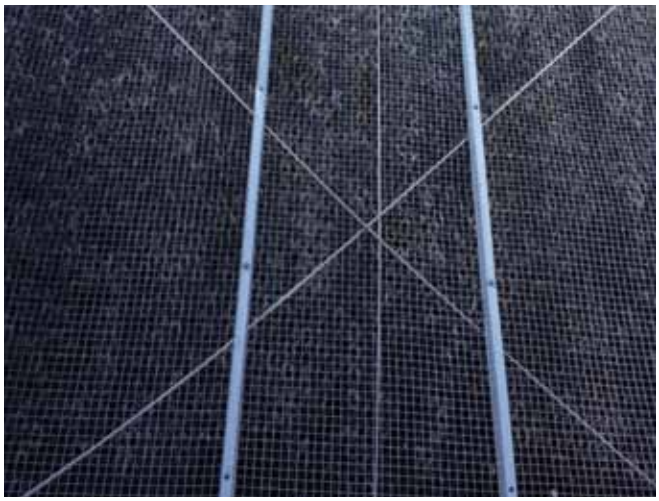
Vulcan S250 installed on a 10 inch diameter line that feeds twin cooling towers (CT-1 and CT-2)



This photo was taken of the inside of CT-1 on August 9, 2013.

It illustrates clean flutes that are in constant contact with Vulcan-treated water and a few dry (untreated) areas that still have some remaining green biofilm.

The photographs above were taken of CT-1 about 3 weeks after the Vulcan was installed (August 6, 2013).



These photos were taken of CT-1 after about 6 weeks (August 20, 2013).

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Test report on Vulcans (pulsed water treatment systems) installed as a preventive measure against scale buildups causing faulty of the cooling towers

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Cooling Tower C

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TÜV Nord Certificate

Germany

TÜV NORD

Zertifikat

Certificate

Registrier-Nr.
Registered No.
44 324 12 409661

Zeichen des Auftraggebers *Customer´s reference*	Auftragsdatum *Date of order*	Aktenzeichen *File reference*	Prüfbericht Nr. *Test report no.*
Herr Christiani	21.06.2012	2.4-234/94 Golo/Er	12324409661 - 002

Name und Anschrift des Auftraggebers
Christiani Wassertechnik GmbH
Köpenicker Str. 154
10997 Berlin
Name and address of the customer

ist berechtigt, das unten genannte Produkt mit dem abgebildeten Zeichen zu kennzeichnen
TÜV NORD GS geprüfte Sicherheit
is authorized to provide the product mentioned below with the mark as illustrated

Fertigungsstätte
Christiani Wassertechnik GmbH
Köpenicker Str. 154
10997 Berlin
Manufacturing plant

Geprüft nach **DIN EN 60335-1:2012-10**
Tested in accordance with

Das Produkt entspricht den Anforderungen des Produktsicherheitsgesetzes ProdSG § 21
The product is conform with the requirements of the Product Safety Act – ProdSG § 21

Beschreibung des Produktes (Details s. Anlage 1)
Wasserbehandlungsgerät
Typ Vulcan xxx
Water treatment equipment
type Vulcan xxx
Description of product (Details see Annex 1)

TÜV NORD CERT GmbH
Zertifizierungsstelle
Fachleiter Konsumgüter

Gültig bis / *Valid until:* **13.12.2017**

Essen, 14.12.2012

Bitte beachten Sie auch die umseitigen Hinweise
Please also pay attention to the information stated overleaf

Langemarckstr. 20 • 45141 Essen • Fon +49 (0)201 825 5120 • Fax +49 (0)201 825 3209 • Email: prodcert@tuev-nord.de

CE Certificate

Germany

CE Declaration of Conformity

Issuer's name and address: Christiani Wassertechnik GmbH
Köpenicker Str. 154
10997 Berlin
Germany

Product: Water conditioning appliance

Type designation: Vulcan
3000/ 5000/ S10/ S25/ S100/ S250/ S500

The designated product is in conformity with the European Directive:

89/336/EEC
including amendments

„Council Directive of May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility".

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive.

DIN EN 55014-2 (VDE 0875 Teil 14-2): 2002-08; EN 55014-2:1997 + A1:2001
Requirements of category II
DIN EN 55014-1 (VDE 0875 Teil 14-1); 2003-09; EN 55014-1:2000 + A1:2001 + A2:2002
DIN EN 61000-3-2 (VDE 0838 Teil 2): 2001-12; EN 61000-3-2:2000
DIN EN 61000-3-3 (VDE 0838 Teil 3): 2002-05; EN 61000-3-3:1995 + Corr.:1997 +A1:2001

The VDE Testing and Certification Institute (EU Identification No. 0366), Merianstr. 28, 63069 Offenbach, has tested and certified the product granting the VDE Approval for the mark(s) as displayed.

Certificate No. 94050
File Reference 1898800-4521-0001 / 75684 FG43 / FU

Berlin, 15. July 2013
(Place, Date)

(Legally binding signature of the issuer)

CWT Christiani Wassertechnik GmbH
Köpenicker Str. 154
10997 Berlin
Germany

Clients

Excerpt from our client list worldwide

Christiani Wassertechnik GmbH (CWT)
Köpenicker Str. 154
10997 Berlin
Germany

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Fax: +49 (0)30 - 23 60 77 8-10
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USA dial: +1 917 300 0494

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www.cwt-international.com
Web USA / Canada:
www.vulcan-descaler.com