



# References and Studies

Cooling Towers / Chillers / Heat Exchangers





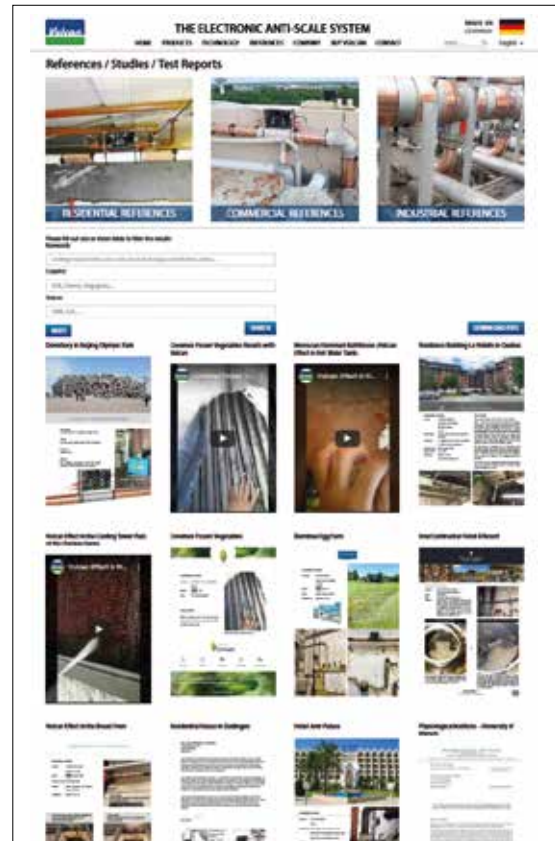
# Vulcan Reference Database

This reference book shows only an excerpt of the available Vulcan references.

All Vulcan references from world-wide you can see and download at:

[www.cwt-vulcan.com/reference](http://www.cwt-vulcan.com/reference)

There you can also search references by **keyword**, **country** or **Vulcan model**.



## PDF Download and Online Live View

### Vulcan Reference Book

Online live view: [www.bit.ly/rben-web](http://www.bit.ly/rben-web)



Download PDF: [www.bit.ly/vrben](http://www.bit.ly/vrben)

### Vulcan Cooling Tower Reference Book

Online live view: [www.bit.ly/rbcten-web](http://www.bit.ly/rbcten-web)



Download PDF: [www.bit.ly/vrbcten](http://www.bit.ly/vrbcten)

Nestlé

INTERCONTINENTAL  
HOTELS & RESORTS

SWAROVSKI

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DAIMLER BENZ

Hotel Terme Dolomiti

R  
RENAISSANCE  
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ARENA

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Coca-Cola

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HYATT

BorgWarner  
BERU Systems

Heineken

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RheinChemie

Grundschule  
Langwedel

VARIOPLAST

OPER / KÖLN

ALCOA

BAYER

Klemenz  
Infusionslösungen  
Injektionslösungen

HOLSTEIN  
THERME  
BAD SCHWARTAU  
Quelle meiner Erholung  
Jodsole-Thermalbad

STADTWERKE  
ERFTSTADT

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ALDI  
süd

Hela

WBM  
Wohnungsbaugesellschaft  
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PARK HOTEL  
REIMEN

Deutsche  
Rentenversicherung

Gegenbauer

TDK

ZE

BEUTELBACHER  
Fruchtsäfte

Lam Dicken Fritz  
Konditorei & Confectionerie  
seit 1809

VW

K water

HOTEL TERME  
Milteplini

SWM  
Stadtwerke München

COSWIG  
Produktion

UNIVERSITY OF CAMBRIDGE

McClean  
Safe and clean toilets

Bad  
Mergentheim

WALTER RAU  
NEUSSEER ÖL UND FETT AG

Carl-Benz-Gymnasium  
LADENBURG

ESSLINGEN

GETRAG

SÜDMILCH

HP Hotel President \*\*\*  
Chianciano Terme Siena, Toscana Italia

STAEDTLER

## Acacia Hotel Manila

Philippines



Tien Phong  
Technologies

ACACIA  
HOTEL MANILA

### Acacia Hotel, Manila, Philippines

The Acacia Hotel is a five-star Hotel locating in Alabang, Manila.

Acacia Hotel Manila exhibits the excellence of a homegrown brand that is deeply rooted in passion, excellence, and service.

The hotel prides itself in creating an atmosphere of hospitality and exemplary service.



Like other hotels, they use chiller systems with cooling towers to provide cool air for whole hotel. And with hard water, they have problems with scale in the heat exchanger and they have used chemicals to solve.

With a desire to replace chemicals, they are looking for physical water treatments and find Vulcan. **After installing Vulcan S500 unit, their heat exchanger always stays clean without any chemicals.**

Here is the comment of the chief engineer: "The results are positive. We have recorded condenser approach value for 2 to 6 months after cleaning the tubes of the condenser, and there was a significant decrease on our chillers' condenser approaches. Our cooling towers remained clean and some of the stock-up and passing valves are now usable. As regards the performance of the unit, we found it works well."

**Model:** Vulcan S500

#### **Installation Location:**

Main water supply of the cooling tower

#### **Purpose:**

- Clean scale deposit
- Prevent scale
- Reduce maintenance costs
- Replace chemical treatment and softener systems

#### **Before Vulcan installation:**

- Scale deposits in the heat exchanger
- Pipes clog

#### **After Vulcan installation:**

- Chiller and cooling tower stay clean
- No need to use chemicals



Vulcan S500 on cooling tower water pipe



Chiller #3 Condenser  
Ø 67 cm, tube Ø 7/8", length: 418 cm



inside the tube



inside the tube



Tien Phong Technologies Co., Ltd

No. 30, Street 12, Binh Hung Hoa ward, Binh Tan District, HCM City, Viet Nam

Web: [tpcorp.com.vn](http://tpcorp.com.vn) Email: [sale@tpcorp.com.vn](mailto:sale@tpcorp.com.vn)



## Acacia Hotel Davao

Philippines



### ACACIA HOTEL DAVAO

With Acacia Hotel Manila as a stronghold, Acacia Hotel Bacolod stands firm, achieving amazing feats, paving the way for the soon to rise, Acacia Hotel Davao, opening in quick succession.

Acacia Hotel Davao provides 260 guest rooms and 9 spacious event spaces.

Dear Mr. Phat,

Good Day! Our company was very pleased with the Vulcan results installed on our main condenser line and main hot water line in Acacia Hotel Manila.

Although there were a few conflicts that happened last May, the problems have been solved gradually until November when the approach temperature was back to normal at 3-6 °C due to the instructions you have given and a few more regular cleanings.

Also, this year's summer season in the Philippines, the temperature reached its hottest record at 37 °C here in Manila, however, due to the improved and cleaned A/C system, we haven't got any problem with it.

With those positive results, our head office has decided to install another unit in our next hotel, located at Davao City. The A/C system design was the same as ours, with 16-inch pipe.

Hope to get your positive response soon regarding to the new installation. Thank you.

*Aldrin*

Assistant Chief Engineer

Acacia Hotel Manila



Vulcan S500 treats the A/C system in the new hotel — Acacia Hotel Davao



Vulcan S500 impulse bands



Vulcan S500

## Barceló Bavaro Palace




Dominican Republic



The 5-star Barceló Bávaro Palace hotel is one of the top luxury hotels in Punta Cana, designed specifically for people who love constant sunshine, the gentle sound of the Caribbean breeze whispering in the palm trees, and beautiful crystal-clear waters with a coral reef. The hotel is beside one of the 10 most stunning beaches in the world.

### Installation details

**Location:** Barceló Bávaro Palace  
La Antagracia, Dominican Republic  
[www.barcelo.com](http://www.barcelo.com)

**Models:** 2 x  S100 in hotel's main hot water lines  
3 x  S250 for cooling towers  
4 x  S500 for cooling towers

**Installed by:** InterClima

### The results

The project began with a mechanical room energy audit resulting in a great opportunity to upgrade the existing equipment with a very short payback period. The original installation was sold with an estimated payback of less than 2 years. To our customer's happy surprise, the actual payback was 9 months! The hotel maintenance manager is very impressed with the performance of the Vulcan systems, this opened up many additional opportunities including the subsequent chiller and cooling tower replacements.

Before Vulcan S100 was installed in hotel's main hot water line, the storage tanks had a solid 3 cm thick scale layer inside them and the pumping pressure from the booster set was at maximum while being unable to deliver adequate water pressure to the end of the line hotel rooms. After the 3 months period, an inspection of the inside of the storage tanks revealed that the scale layer was soft allowing them to mechanically clean them removing most of the calcium deposits. Other the following 12 to 18 months, the distribution lines also cleared up resulting in much improved flow and lower pumping costs from the booster sets.

The manager was instrumental in the approval of the resent trial installation of an S250 in the Royalton White Sands (Jamaica). We will continue to use the Barceló success in our future presentations.

### Installation purpose

Most of the hotels in the area of Bávaro/Punta Cana in eastern Dominican Republic depend on ground water wells for their domestic water supply, using traditional water softening equipment to reduce the scale and hardness of the water. The fact is that some of these resorts have very poor maintenance resulting in extensive scaling of cooling towers and domestic hot water piping and equipment.



3 chillers were treated by 3 Vulcan S500



Aerial view of Barceló Bávaro Palace next to the Bavaro beach, Higuey




## Beijing Kunlun Hotel

China



### Installation details

- Location:** Beijing Kunlun Hotel  
[www.thekunlunbeijing.com](http://www.thekunlunbeijing.com)
- Area:** Living hot water system in the office area
- Model:**  Vulcan S10
- Installation purpose:** To solve the scale problems for the gas water heaters, the pipes and the shower heads, and also to extend the cleaning intervals, save gas and improve operating efficiency.
- Installed by:** Beijing Vulcan Water

### About Beijing Kunlun Hotel

Located in Beijing, is a five-star business hotel. Over the years, with its luxury hardware facilities and excellent service, it has been well-known abroad.



Vulcan S10 treats the living hot water for the office area.



Beijing Kunlun Hotel.

## FAMU / FSU (Vulcan effects on cooling towers)


Florida Agricultural Mechanical University / Florida State University

USA



### Vulcan Effects on Cooling Towers

#### Installation details

Location:	FAMU/FSU College of Engineering
Area:	On the 10 inch diameter line that feeds twin cooling towers (CT-1 and CT-2)
Model:	 S25
Objectives:	<ol style="list-style-type: none"> <li>1. To prevent scale buildup on the cooling towers</li> <li>2. To remove the existing scale</li> <li>3. To eliminate the need for chemicals or time-consuming cleaning procedures</li> <li>4. To reduce energy costs</li> </ol>
Installed by:	Akkurilabs, Inc.

#### 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

**After 2 weeks**, the green biofilm had begun to recede and gradually disappear.

**After 3 weeks**, the green biofilm had been further reduced and the scale deposits had begun to separate from the flutes in coin-sized flakes.

**After 1 month**, 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%**.

The Vulcan does not change the water quality beyond its affect on its propensity to cause scale buildup. The pH, conductivity, dissolved oxygen level, and turbidity remained relatively constant during observation from before the installation to over a month after.

We are very optimistic about continued improvement with Vulcan.



The photo above was taken of CT-1 about **3 weeks** after the Vulcan was installed.



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



The inside of CT-1, after **3 weeks** with Vulcan. 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 photo above was taken of CT-1 about **6 weeks** after the Vulcan was installed.



# 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 off in big chunks and now it is completely scale free.



Installation of Vulcan Descaler for the entire building's 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. 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

## Marigot / Swarovski Crystal

Vietnam



### Installation Details

**Location:** Marigot Vietnam LLC  
(A company of Swarovski Group)  
[www.swarovski.com](http://www.swarovski.com)

**Area:**

- Cooling towers
- Process water
- Water supply

**Model:**

- 6 x Vulcan S500
- 1 x Vulcan S10
- 3 x Vulcan S25
- 2 x Vulcan S100
- 2 x Vulcan S500

**Installed by:** Chuc Hien Dat

### Before Vulcan

1. Cooling towers: chemical dosing was necessary.
2. Process water pipes: cleaned every 3 months by chemical.

### Vulcan Effect

1. Cooling tower and chiller system: after Vulcan S500 has been installed for 1 year, the condenser approach temperature < 2°.
2. Cooling tower: after installing Vulcan, we still keep the chemical dosing system and check the water monthly. We reduce chemicals every month. After 6 months with Vulcan, the chemicals have been greatly reduced more than 80%.
3. Process water pipes: no need to clean every 3 months. The client has never cleaned by far with Vulcan.



S500 for the chiller



Impulse bands covered by pipe insulation



S10 for the process water pipe



S25 and S100 for the water supply



V5000 for the process water pipes



S500 for the cooling towers

### SWAROVSKI

is a crystal producer headquartered in Austria. Swarovski has been a family-owned business since it was founded in 1895 by Daniel Swarovski.

### Marigot Vietnam LLC

is part of the Swarovski Crystal Business, which represents the largest area of business for the Swarovski Group. Marigot Vietnam LLC manufactures jewelry and fashion accessories.





# Hyundai Motor

Korea




## Installation Details

**Location:** A car engine manufacturing factory,  
Hyundai Motor Ulsan

**Area:** A cold water circulation pipeline for the cooling tower and the induction hardening machine

**Pipe size:** 100 mm

**Model:**  Vulcan S25

**Installer:** Vulcan-Korea team

## Scale Problems

1. Scale problems in the pipelines and the induction hardening machine.
2. There are 9 secondary small pipes, they had to be cleaned manually every 2-3 months.



There are 9 secondary small pipes with water meters. These meters were installed to make sure a stable flow rate. If the flow rate goes down, it would cause a problem of the induction hardening machine. Therefore, the pipes had to be cleaned manually every 2-3 months.

## Vulcan Effect

**Installation of a Vulcan S25 unit:**  
May 21st, 2018.

Note: scale was not manually removed before the Vulcan was fitted on source pipe (see photo).

**Examination of secondary piping:**  
November 21st, 2018

1. Since Vulcan S25 was installed, the Hyundai Engineering Team has stopped the regular manual cleaning process.

**Observation:** the flow rate with the Vulcan unit is now even higher than immediately after previous manual cleaning had been done.

2. After Vulcan S25 had been installed for 6 months, the secondary pipes were opened: scale that had been left in piping had disappeared and all 9 secondary pipes had become clean (see photo).

**Observation:** Biofilms in the cooling tower had disappeared since the Vulcan unit was installed.



Vulcan S25 was installed around 50 meter before the induction hardening machine.



**First inspection:**  
May 21, 2018.

Inside of a secondary small pipe, before Vulcan S25 was installed.



**Last inspection:**  
November 21, 2018.

After 6 months with Vulcan treatment: the pipe is free of scale.

## COVEMEX Frozen Vegetables

Mexico

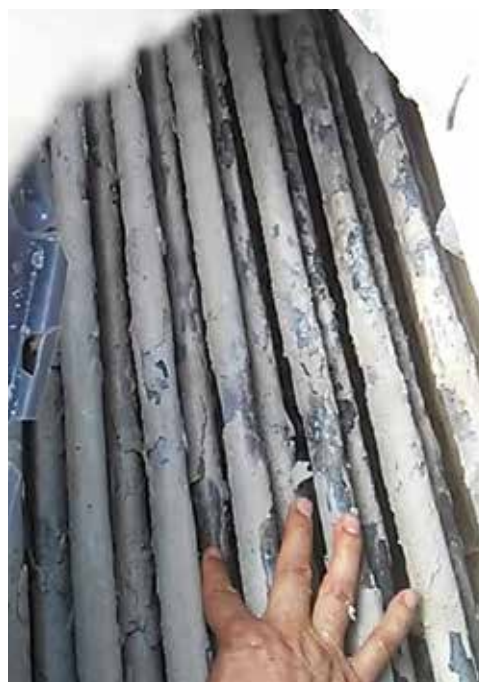


### Installation Details

Location: COVEMEX Frozen Vegetables,  
Mexico

Model:  S25 x 1  
S100 x 1

Area: The heat exchanger



### Vulcan Effect

"After 6 months, as you can see the good results on the video. you can take the scale out with hands, easily."

See the video here: [bit.ly/covemex](https://bit.ly/covemex)



Growing



Harvest



Freezing



Packaging



Transportation

COVEMEX is a Mexican enterprise, dedicated to the processing of high quality frozen vegetables. The integral process goes from the field to the customers, from controlling the land, fertilizers, harvest, packaging and transportation.

[www.covemex.com](http://www.covemex.com)




# Yunnan Salt Industry

China




## Installation 1

Location: Before the heat exchanger of the first cooling water system  
Pipe size: 80 mm  
Model:  S25  
Result: After 2 months, the heat exchanger was opened. It was found that the scale on the wall of the heat exchanger became muddy and easy to clean.



Vulcan S25 was installed in front of the heat exchanger for the cooling water pipe

## Installation 2

Location: Before the heat exchanger of the second cooling water system  
Pipe size: 100 mm  
Model:  S100  
Result: The water cooling system keeps running stably. It is not necessary to clean the scale every 2 months like before anymore.



Vulcan S100 was installed in front of the heat exchanger for the cooling water pipe

## Without Vulcan



Before installing Vulcan, the scale was very thick and hard in the heat exchanger tubes.

## After installing Vulcan for 2 months




The scale becomes soft and muddy.

## Asia Fish Oil Corporation (AFO)

Vietnam

**Ranee**  
CÔNG TY CỔ PHẦN

### Installation Details

Location: Asia Fish Oil Corporation (AFO)  
www.ranee.com.vn  
Area: The cooling water pipe of the chiller  
Model: 3 x  S25  
Installed by: Chuc Hien Dat

### Scale Problems

Scale was in condenser tubes of the chiller and the cooling tower, so that the condenser approach temperature of the chiller was too high  $> 8^{\circ}\text{C}$ .

### Vulcan Effect

After 1 year with Vulcan, the condenser approach temperature of the chiller has been reduced and no need to clean every 6 months.

### Asia Fish Oil Corporation (AFO)



Specializing in processing and distributing premium cooking oil from fish, the head quarter is located in Vietnam.

The cooking fish oil is also exported to the international markets, like China, Singapore, Korea, Japan, Middle East ...



Installing Vulcan S25 for the new chiller.



The Vulcan S25 was installed to treat the old chiller.



## Noon Crop Science

China



### Installation details

Location: Jiangsu Noon Crop Science Co., Ltd  
[www.noonchem.com](http://www.noonchem.com)

Model:  S25

Area: Cooling tower water inlet

Purpose: Solving scaling problems in the cooling tower condenser tubes

Result: Without Vulcan, the internal cooling tower was heavily scaled, which seriously affected the heat transfer.

The cooling tower had not been cleaned before the Vulcan S25 was installed.

**After 6 months**, the old scale had disappeared and no new scale was formed. The customer is very satisfied.

Installer: Xinriyuan Company



Vulcan S25 was installed at the water inlet of the cooling tower.

### Vulcan effects on the cooling tower condenser tubes – before and after

Without Vulcan, the internal cooling tower was heavily scaled, which seriously affected the heat transfer.



**After 6 months**, the old scale had disappeared and no new scale was formed.



## Medicine Factory

Japan



### Vulcan test report on cooling tower in a medicine factory

#### Installation Details

<b>Model:</b>	Vulcan S100
<b>Location:</b>	A medicine factory
<b>Treatment Area:</b>	cooling tower
<b>Circulation water capacity:</b>	100 m <sup>3</sup> /h
<b>Pipe Diameter:</b>	150 A



The cooling tower roof of medicine factory

#### Purpose:

1. Prevents from scale
2. Prevents from heat exchanger effectiveness loss
3. Cleaning maintenance cost of plate heat exchanger can be reduced

#### Effect:

After Vulcan was installed for some months, the scale in the cooling tower, plate heat exchanger and the pipe become soft; and it can be removed easily with a finger.



Vulcan S100 installation

#### Cooling Tower Grid



Before Vulcan was installed: the outside of the cooling tower.



After Vulcan was installed for 5 months: the scale can be removed easily with a finger.



Before Vulcan was installed: the inside of the cooling tower.



After Vulcan was installed for 5 months: the scale has been reduced.





### Plate Heat Exchanger



After Vulcan was installed for 9 months: ready open the plate heat exchanger and clean.



After Vulcan was installed for 9 months: the plate heat exchanger was taken apart for cleaning.



The scale on the plate heat exchanger becomes soft.



The scale can be easily removed.

### Circulation Pipe



Circulation pipe.



The scale in the circulation pipe can also be easily removed with a finger.

## Medicine Factory

Japan

### Vulcan test report on cooling towers


Cooling Tower A Cooling Tower B



Cooling Tower C



#### Installation details

Model:  S25 x 2  
Location: A pharmaceutical factory in Japan  
Area: Cooling towers  
Pipe: 50 mm and 80 mm  
Capacity: 25 m<sup>3</sup>/h



Vulcan S25 was installed on the makeup water pipe for the cooling towers A, B and C.



Vulcan S25 was installed on the circulating water pipe for the cooling towers C.

#### Objectives

1. To prevent scale buildup on the cooling towers.
2. To reduce chemicals usage. (measured for complying with ISO 14001)
3. To save the energy cost and to improve the efficiency of the heat exchanger.

#### Vulcan effects

- No chemical water treatment.
- During this 6-month trial period, no scale formation was found on the refrigerators and the heat exchanger tubes.
- No water pollution warning was displayed. (Without chemicals, the water quality usually begins to deteriorate and then the water pollution warning will be displayed.)
- Silica adhered on the cooling towers was easily removed with a finger.

#### Vulcan effect — before and after

Before



After 6 months



Silica could not be removed by the high pressure water gun, but can be peeled off with a nail.



Silica could be removed by the high pressure water gun, and the remaining silica can be removed with a finger.



## Xingbao Plastic

China



### Installation details

Location: Kunshan Xingbao Plastic  
www.xinbaoplastic.com

Model:  S150 was installed for an injection molding workshop  
 S250 was installed for an air conditioning circulating water system

Installed by: Xinriyuan

### Xingbao Plastic

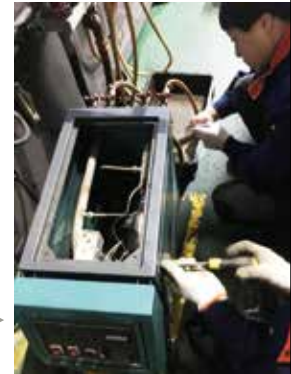
It covers 40,000 square meters and has about 400 employees. The major business lines include plastic injection, product assembling, painting, non-conductive vacuum metallization and mold manufacturing, and its wide ranges of products in the fields of electronics, home appliances, auto parts, medicine, and gardening are exported throughout the world.

### The scaling problems and the result

The injection molding machine had been scaled badly for years, so it was always difficult to clean the pipe, especially the heat exchanger of the mold temperature controller. The traditional cleaning way is to use chemicals, but it is costly and difficult, and it also harms the heat exchangers and pipelines.

After Vulcan S150 and S250 were installed, the clients are fully satisfied with their performance because they solved the scaling and iron filing problems on injection molding machines.

One and a half years after Vulcan was installed, we opened the mold temperature controller and checked the heat exchanger.



Untreated heat exchanger for 3 years.



After installing Vulcan for 1.5 years, the scale is gone without extra cleaning.



## Beauty Star Plastic Packaging

China



*Beauty Star*



### Beauty Star Co., Ltd.

Beauty Star Co., Ltd. is a state-owned enterprise that produces plastic packaging boxes, cosmetic packaging boxes and other injection molding products. It also cooperates for years with Wrigley Company, SK2, Blue Moon Industry and many other famous enterprises.

### Installation details

Model:  S150

Location: On the pipe of the dust-free workshop

Purpose: To solve the scaling problems of the injection molding machine

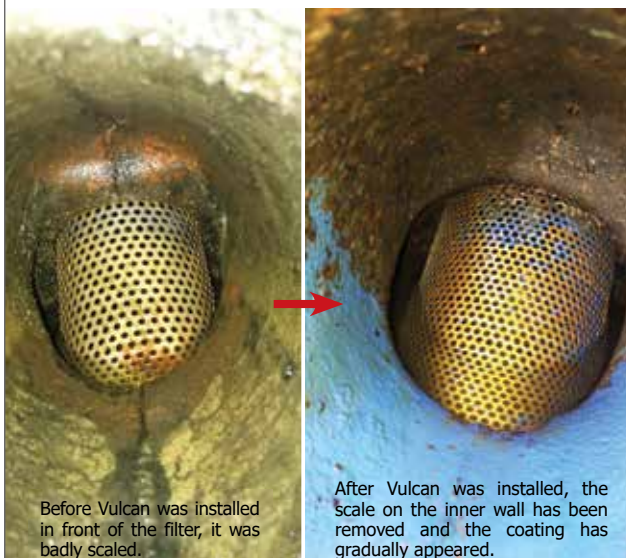
Installed by: Xinriyuan Company

### Before Vulcan was installed:

The heat exchanger and the pipe were badly scaled.

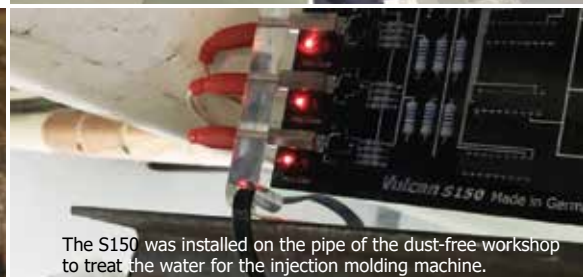
### 6 months after Vulcan was installed:

- When we opened the valve of the heat exchanger, we noticed that a lot of scale had disappeared
- The chiller and the cooling tower stay clean
- The "small holes" of the injection molding machine have become very clean, when they were blocked before, and the corrosion on the valve has gradually disappeared.

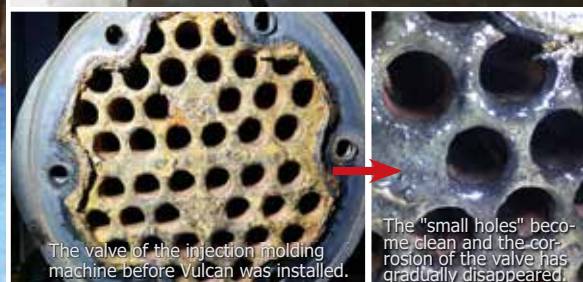


Before Vulcan was installed in front of the filter, it was badly scaled.

After Vulcan was installed, the scale on the inner wall has been removed and the coating has gradually appeared.



The S150 was installed on the pipe of the dust-free workshop to treat the water for the injection molding machine.



The valve of the injection molding machine before Vulcan was installed.

The "small holes" become clean and the corrosion of the valve has gradually disappeared.





# MiTAC Computer

China



DATACENTER
AUTOMOTIVE
SERVERS & STORAGE
AIOT
EMBEDDED
PROFESSIONAL
SMART BUILDING

### Installation details

**Location:** MiTAC Holdings Corp. (Kunshan)  
www.mitac.com

**Model/Area:** **1 x S500, 7 x S250** were installed to treat air conditioning systems  
**2 x S50, 4 x S25, 10 x S10** were installed to treat hot water systems (boilers) in the dormitory

**Problems:**

1. Air-conditioning systems had serious scaling problems, and the heat exchange efficiency had been reduced.
2. The silica on the cooling tower surface was difficult to remove and the maintenance cost was too high.
3. The inside pipelines were rusted and it was not possible to use too much chemical.
4. The hot water flow in the dormitory was low, and the water was often yellow.

**Installed by:** Xinriyuan Company

### Vulcan effect in the factory — before and after

Cooling tower fins: the silica ( $\text{SiO}_2$ ) which was usually accumulated in the fins has disappeared; the energy consumption of the air conditioning systems and the cleaning effort have been reduced.




Without treatment      After 6 months

### Vulcan effect in the dormitory — before and after

#### Pump




Before      After 6 months

#### Valve




Before      After 6 months




Without treatment      After 9 months

Cooling tower valve: large amount of sludge and scale have been gradually reduced.

#### Filter




Before      After 6 months





Without treatment      After 6 months      After 9 months

Pipe fittings in the office: they were seriously corroded, now the rust and mud on the inner wall have gradually disappeared.

## TDK Electronics


China


### Our Ideas for the Future




#### Installation details

Location: TDK Dalian Electronics | [www.jp.tdk.com](http://www.jp.tdk.com)  
Model/Area:  **Vulcan 5000** x 1 for reverse osmosis pure water system

 **Vulcan S10** x 1 for circulating cooling system of the vacuum pump

 **Vulcan S150** x 1 for circulating cooling system of the Refrigerator No.5

 **Vulcan S250** x 1 for circulating cooling system of the Refrigerator No.4

Results: The factory has a few cooling systems, they all had scaling problems. The customer started testing the Vulcan S10 in a small cooling system. After 1.5 years, the customer was very satisfied with the S10 results, then another 3 Vulcan devices were purchased.

Installed by: Dalian Jiayifang



TDK Dalian Electronics Co., Ltd. is a Japanese-owned company established in 1992. The company is covering an area of 137,000 square meters and employs 1,430 people. Mainly engaged in the manufacture, processing, assembly and sales of ferrite products.

#### Vulcan S10 effect verification

##### Before Vulcan

The pipe had been used for 15 years and had a very thick hard scale layer inside. The pipe was not cleaned before Vulcan S10 was installed. The following two photos are the observation points selected before Vulcan installation.



##### After Vulcan S10 was installed for 4 months

The scales inside the pipe have been gradually reduced, and they do not fall off in blocks, which will not affect the operation of pumps and other equipment. Because of the good results, the customer decides to apply Vulcan in several other cooling systems.



The Vulcan S10 was installed on the circulating cooling water system of the vacuum pump, and the customer is very satisfied with the results.



Vulcan 5000 was installed for RO system.



Vulcan S150 was installed on the circulating cooling system of the refrigerator No.5.



Vulcan S250 was installed on the circulating cooling system of the refrigerator No.4.



## THK Precision Industry

China



[www.thk.com](http://www.thk.com)

### THK Precision Industry Manufacturing Liaoning Co.,Ltd.

#### Installation details

Model: Vulcan S25

Location: THK Precision Industry

Installation area: The main water pipe of cooling tower

Installed by: Dalian Jiayifang

We used chemicals to remove the scale of cooling tower before. After Vulcan was installed, we stopped the dosing process, and all equipment is still running well. Vulcan completely replaced the chemicals and saves cost for the company.

In winter, the cooling tower runs with less water and full of ice, we observe every week and find that the scale is gradually reduced. After 4 months running with Vulcan, the scale in the water tank and cooling tower has been significantly reduced.



THK's Linear Motion (LM) Guide devices are an indispensable component of mechanical and electronic systems in a wide variety of industries, which are manufactured by THK for supply to customers worldwide.



Vulcan S25 installed on the main water pipe of the cooling tower.



甲一方水务科技  
JiaYiFang Water Technology


[www.vulcan-jiayifang.com](http://www.vulcan-jiayifang.com)

## Toray Industries

Korea



### INSTALLATION DETAILS

Location:	Toray Industries, Inc Gyeongbuk, Korea
Installer:	DAWO INT Co., Ltd.
Model:	 S25
Pipe size:	100 mm



Toray Industries produce, process and sell the following products: Fibers and textiles, plastics and chemicals, IT-related products, carbon fiber composite materials, environment and engineering products and pharmaceuticals and medical devices.

### SCALE PROBLEM AND APPLICATION

1. Scale problem on the plate heat exchanger
2. Regular (every 2-3 months) chemical cleaning of the pipes and heat exchangers



Vulcan S25 installed at Toray Industries



Before – without Vulcan



After 3 months – with Vulcan treatment.  
Up to now the installed pipeline needed no cleaning.



## Delphi Technologies

China

### Delphi Technologies

#### Installation Details

Location: Delphi Technologies  
Yantai Plant, China  
[www.delphi.com](http://www.delphi.com)

Purpose: For environmental protection and energy-saving, Vulcan replaces scale and corrosion inhibitors


Installed by: Beijing Vulcan Water



Delphi Technologies provides combustion systems, electrification products and software and controls, and operates in the passenger car and commercial vehicle markets, and in-vehicle repair through a global aftermarket network. It is headquartered in London, U.K. and operates technical centres, manufacturing sites and customer support services in 24 countries.

#### Installation 1

Location: Cooling circulating water system of the chiller


Model:  S500

Purpose: To solve the scaling problem of the condenser



#### Installation 2

Location: Cooling circulating water system of the air compressor


Model:  S150

Purpose: To solve the scaling problem of the cooler



#### Installation 3

Location: The water distribution nozzles in the cooling tower

Model:  S50

Purpose: To solve the scaling problems of the exchange surface




## Zhongyuan GKN Cylinder

China



### Installation details

Location:	Zhongyuan GKN Cylinder www.gkn.com
Area:	Main inlet pipe of the cooling towers of the molding factory
Pipe/Capacity:	80mm, 12 m3/h
Model:	 Vulcan S25
Purpose:	To solve the scaling problems in the cooling towers of the molding factory. <i>1. Even with a water softener, the outer walls of the cooling towers were still scaled badly, so that the heat exchange efficiency was reduced.</i> <i>2. Especially in summer, when the cooling effect did not meet the standard requirement, the alarm would ring.</i> <i>3. Each time when an alarm rings, workers need to clean the scale manually along with a sandpaper. The workload is large but the effect is bad.</i> In order to verify the Vulcan effect, the water softener was stopped and no other water treatment has been used during the period.
Treatment area:	The main inlet pipe is divided into 6 branches for spraying and cooling, and 6 cooling towers are connected respectively.
Installed by:	Shaanxi Wasser

### Zhongyuan GKN Cylinder

Zhongyuan GKN Cylinder is the largest manufacturer of cylinder liners in Asia, which is a joint venture established by GKN Industrial Group (Guest, Keen & Nettlefolds), one of the world's top 500 companies.

It mainly produces high-horsepower cylinder liners for trucks, construction machinery, marine engines and generator sets, and has an annual production capacity of 3 million cylinder liners.



6 cooling towers for the molding factory were treated by Vulcan S25.



Vulcan S25 was installed on the main inlet of the cooling towers for the molding factory.

The cooling tower before Vulcan was installed



The pipe with a cable tie was cleaned as a note.

Vulcan S25 has been installed for 1 month



During the period, the scale has fallen off without any other water treatment.



## Minfeng Metal Works

China

### Baotou Minfeng Metal Works

#### Installed Vulcan models:



1 x Vulcan S500  
1 x Vulcan S250  
4 x Vulcan S25

#### Installation locations:

- The main circulation water pipe for cooling water
- The circulation water pipe for heating water

#### Installed by:

Jiayifang Water Technology

#### About Baotou Minfeng Metal Works

Located in Inner Mongolia, the company mainly produces and sells products made of ferrochrome, ferrosilicon and ferroalloy.



#### Before Vulcan treatment:

Circulating cooling water system uses groundwater, so the water quality is bad and it causes scaling problems in the pipeline. Therefore, the production efficiency is reduced, so the costs are increased. The pipeline was often blocked, so the pressure in the pipe was increased and even made the pipe explode. In the past, the company used salt-based softener to solve the scaling problems, but the result was not satisfactory.

#### After Vulcan treatment:

We stopped the water softener on the day that Vulcan was installed, the effect is very good: after installing Vulcan, we no longer need to strictly control the water temperature. Less than 1 month, we found that the main pipe for cooling water started to drain out rusty water. It shows that Vulcan starts to clean up the scale and rust. After 3 months of Vulcan, our pipes and equipments are still running well without getting blocked.



2 x Vulcan S25

2 x S25 were installed to treat heat exchangers for bathing.



Vulcan S500 / S250

S500 and S250 were installed on the two main inlet pipes for cooling water.



Less than 1 month after installing Vulcan, the main pipe for cooling water started to drain out rusty water.



Vulcan S25



Vulcan S25

2 x S25 were installed on the two heating system pipelines.



甲一方水务科技  
JiaYiFang Water Technology

# Holcim Cement Factory

Vietnam



**Holcim Kien Luong, Vietnam**



## About Holcim cement factory

Holcim is one of the world's leading suppliers of cement and aggregates, and Holcim Kien Luong is the biggest cement factory in Vietnam.

The factory has problems with hard water in chiller, grinder and water supply pipe. They planned to spend nearly 400,000 USD to build and buy chemical systems to solve the problems. However, after installing Vulcan units, all the problems are solved with only 30,000 USD. This is the best investment!

## Before Vulcan installation:

- scale deposits in oil heat exchanger
- oil temperature >50°C: very high
- to clean every month
- heat exchanger has corrosion
- scale deposits clog the pipe

## Installed Vulcan models:



2 x Vulcan S250  
1 x Vulcan S100  
1 x Vulcan 5000

## Installation locations:

- the main water supply for the cooling tower
- the cooling tower for the big grinder
- the cooling tower for the small grinder

## Purpose:

- clean scale deposits
- prevent new scale
- reduce maintenance costs
- replace chemical dosing and softener systems

## After Vulcan installation:

- oil heat exchanger is clean
- temperature is stable at 37°C – 40°C
- no need to stop machines to clean anymore
- save 7% energy consumption at grinders



**Heat exchanger before Vulcan installation**



**Heat exchanger after 2 months Vulcan installation**



**Vulcan S250**



**Vulcan S250**



**Vulcan S100**



**Vulcan 5000**





## Jizhong District Heating Company

China



### Installation details

Location: Jizhong District Heating Company  
 Model/Area: **1 x S500** installed in the heat exchange station  
 (The primary water temperature of the equipment is 65 °C, the secondary water temperature is 45 °C)  
**1 x S250** installed in domestic hot water system  
 (The primary water temperature of the equipment is 80 °C, the secondary water temperature is 60 °C)  
 Testing time: 4 months in total, one winter (November to March)  
 Problem: The water source is groundwater, and the plate heat exchanger was scaled badly.  
 Installed by: Beijing Vulcan Water

### Jizhong District Heating Company



Jizhong Energy Group is based on "central heating" as its main business and integrates energy to develop centralized heating industries. Jizhong District Heating Company, as its subsidiary company, founded in 2010, provides safe and stable heating.



Vulcan S500 was installed in the heat exchange station.

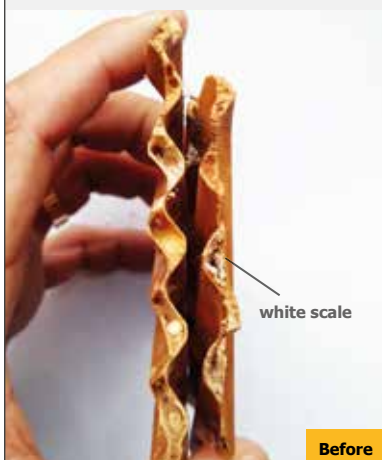
#### The heat exchange station — Vulcan effect on the plate heat exchanger



After 4 months

The water is underground well water. Vulcan S500 was installed after cleaning the plate heat exchanger. After 4 months, no white scale was seen, only yellow rust was left. Although there were still substances in the plate heat exchanger, they had been softened.

#### The domestic hot water system — Vulcan effect on the plate heat exchanger



Before



The white scale has disappeared.



After 4 months

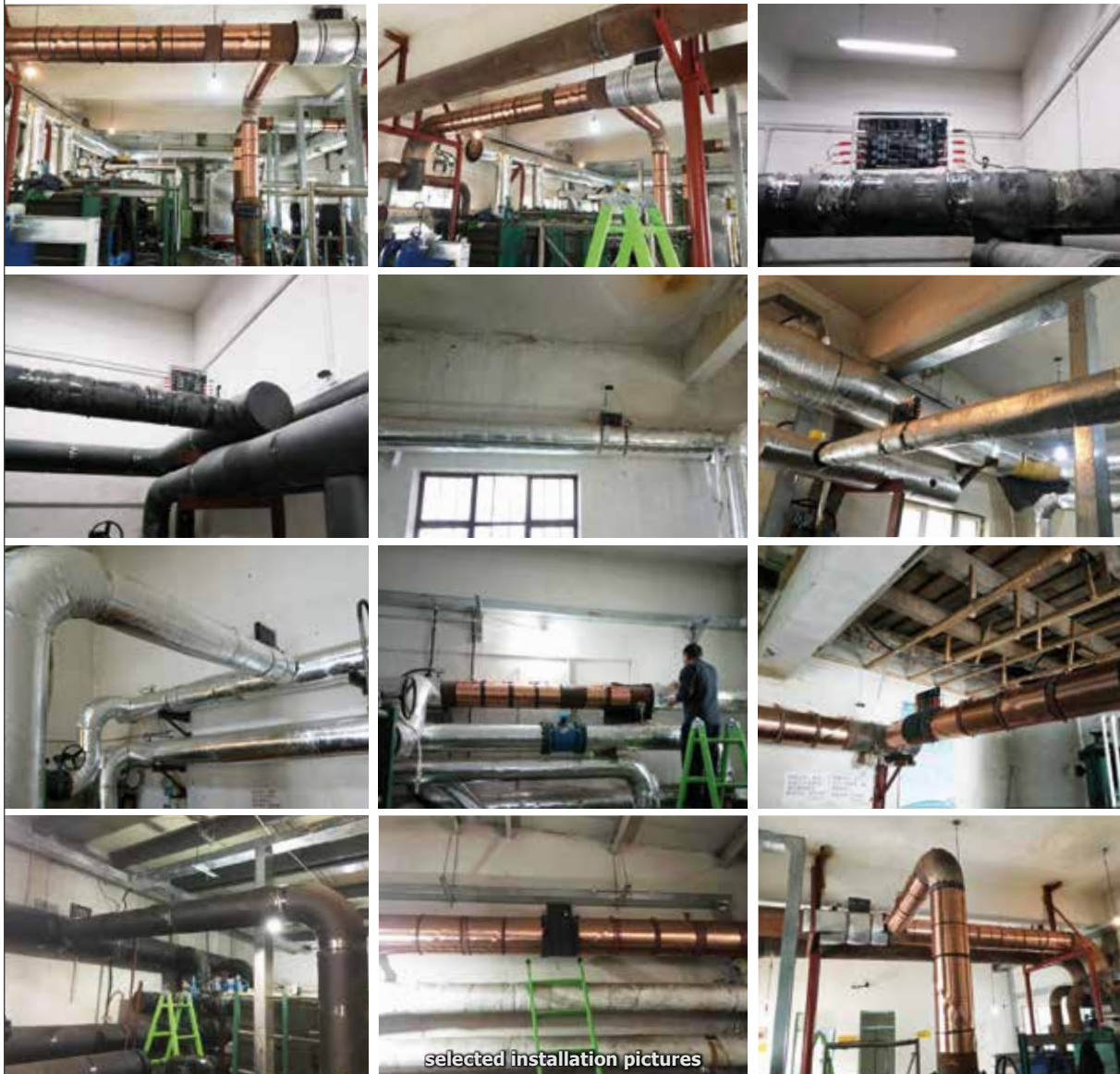
Without Vulcan S250, the plate heat exchanger was scaled badly, and it was almost blocked every month, must be cleaned manually. The scale was hard, could not be removed by hands.

We stopped using any additional chemicals to treat the water. After installing Vulcan S250 for 4 months, the effect was very clear. Although there were still substances in the plate heat exchanger, they had been softened and could be easily removed by hands. There are no more white scales, only yellow-brown impurities left.

## Heating Stations in Yili City

China

### Heating Stations in Yili City, Xinjiang



#### Installation details

Model: 3 x Vulcan S50  
23 x Vulcan S100  
3 x Vulcan S150  
35 x Vulcan S250  
5 x Vulcan S350  
6 x Vulcan S500

Treatment area: There are 16 heating stations in Yili, and each heating station has 2-10 heat exchangers.

Location: Before each heat exchanger

Purpose: To solve the scaling problems of the heat exchangers

Result: The heat exchangers were cleaned before installing Vulcan. The customer gave Vulcan positive feedback that the cleaning interval of the heat exchangers has been extended and the workload has been greatly reduced.

Installed by: A Fei Te



# Beihai Thermal Power Plant — Heat Pump Station

China

## Beihai Thermal Power Plant Heat Pump Station

### Installation Model:



3 x Vulcan X-Pro 1

1 x Vulcan X-Pro 2

Installation Project: A New heat pump station

Installed by: Dalian Jiayifang Water Technology



### Installation purpose:

The heating system in the original heat pump station has serious scaling problems and the heat pump efficiency is reduced, which can not meet the heating demand. Therefore, the Vulcan X-Pro series were installed in the newly built heat pump station to protect the heat pump system and prevent the scale from reducing the heat exchange efficiency.

#### **X-Pro 1 for low temperature water network :** *circulating water system in Beiwang Station*

DN600, water flow 2600 m<sup>3</sup>/h, installed on the inlet pipe of the plate heat exchanger to prevent scale from reducing heat exchange efficiency.



Step 1: Install the impulse bands



Step 2: Pipe wrapped insulation cotton, then install X-Pro 1 unit

#### **X-Pro 1 for heating network :** *circulating cooling water system in Donggang Station*

DN700, water flow 2949 m<sup>3</sup>/h, installed on the water inlet pipe of the heat pump to protect the inside heat exchanger, also to prevent scale from reducing heat exchange efficiency.



Step 1: Install the impulse bands



Step 2: Pipe wrapped insulation cotton, then install X-Pro 1 unit

#### **X-Pro 1 for heating network :** *circulating cooling water system in Central Station*

DN700, water flow 2949 m<sup>3</sup>/h, installed on the water inlet pipe of the heat pump to protect the inside heat exchanger, also to prevent scale from reducing heat exchange efficiency.



#### **X-Pro 2 for condenser :** *circulating cooling water system*

DN1000, water flow 6700 m<sup>3</sup>/h, installed on the water inlet pipe of the heat pump to protect the inside heat exchanger, also to prevent scale from reducing heat exchange efficiency.



Step 1: Install the impulse bands



Step 2: Outdoor installation, pipe wrapped insulation cotton, X-Pro 2 unit into the protective box

# Shengli Oilfield Petroleum Plant

China



The front door of the station 20, Xian-he oil production plant.



The water inlet of heating furnace.

## Installation details

Model: Vulcan S25

Location: Station 20, Xian-he oil production plant,  
Sinopec Shengli Oilfield

Area: The water inlet of heating furnace

## Installation purpose

The gas heats the water in the furnace, then the hot water heats the tubes, so that the water temperature in the tubes rises from 40 °C to 70 °C. The water in the tubes passes through the pump, transported to various wells.

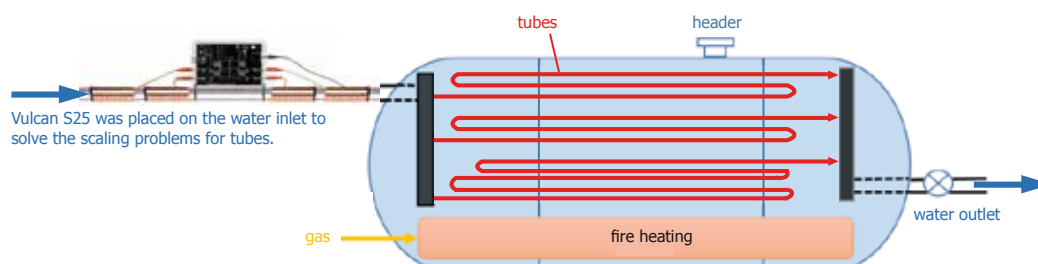
However, the heat exchanger efficiency is decreasing because of scale in the tubes. More gas has to be used to heat the furnace, so that the energy consumption is increased.

The calcium (Ca) content in the water is 1469.09 (mg/L), which is extremely high. The tubes are scaled badly because a variety of cleaning agents are added constantly and also the tubes are kept at a high temperature of 60 °C -70 °C. Every 3 months, the heating efficiency will be reduced down to 50% or even less. After running 1 year, the whole pipelines and the tubes need to be cleaned up manually, which is time consuming and costly, and reduces production capacity.

Therefore, before installing Vulcan, the scale of the tubes was removed. Then Vulcan S25 was installed to see how it performs.

## Installation observation

After installing the Vulcan S25 for 6 months, we found that there is no additional electricity usage, and the overall heat exchanger efficiency is still at 80%. We approved Vulcan and will make the follow-up purchase for the whole project.



In order to heat the water in the tubes, the water temperature of the heating furnace is 70 °C~80 °C. The tubes are marked in red and have scaling problems. The tube diameter is 80mm.



Before installing Vulcan, the rust and pipe insulation were removed, and the impulse bands were wound on the pipe. Then, the outer insulation was put back.



Outdoor installation with self-made cover, to protect the unit from the wind and sun.



## ±800kV UHV Yinan Converter Station

China



### State Grid Corporation of China ±800kV UHV Yinan converter station


The rated power of the **Ultra-high-voltage (UHV) Yinan converter station** is 10 million kilowatts, and the rated current is 6250 amperes. It is the first receiving station project in China where the converter station, synchronous motor station and substation are integrated and started at the same time.



### Installation Details

**Location:** State Grid Corporation of China  
±800kV UHV Yinan Converter Station  
[www.sgcc.com.cn](http://www.sgcc.com.cn)

**Area:** Cooling circulating water system of UHV converter equipment

**Model:**  X-Pro 1

**Purpose:** Beneficial from the German Vulcan electronic anti-scale system: low power, zero chemical dosing, no maintenance, eco-friendly and safety

**Installed by:** Henan Green Control Technology



## The Be'er Sheva Grand Mall

Israel

קמיון עופר

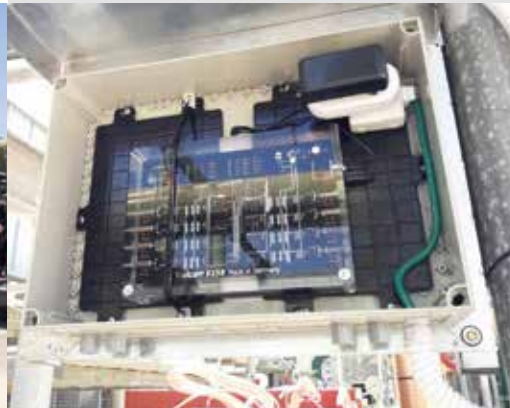
### Installation details

- Location:** The Be'er Sheva Grand Mall, Israel  
myofer.co.il
- Model/area:** **Vulcan** S250 x 4 units for 4 cooling towers
- Problem:** Each cooling tower has 2 heat exchangers.  
The difference in pressure increased between the inlet and outlet of the heat exchanger, which showed a developing blockage.  
The heat exchangers had lost in work capacity every month due to the multiplicity of scale and rust.
- Result:** 5 months after installation, there are no scale issues in any cooling tower heat exchanger systems.  
Due to the excellent results, more Vulcan will be installed for the rest of the company's facilities in Israel.
- Installed by:** EYE-IN ELECTRONICS

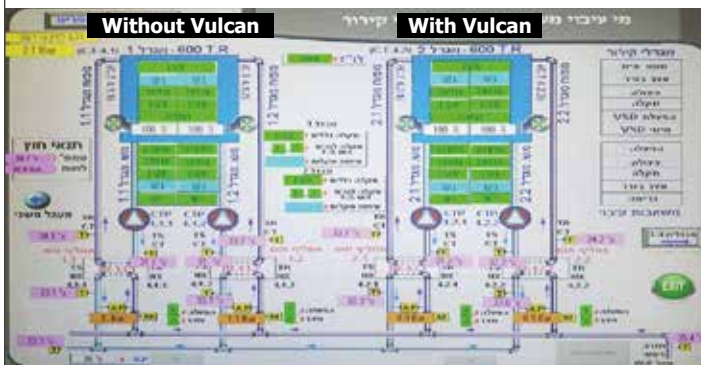


### The Be'er Sheva Grand Mall

The Be'er Sheva Grand Mall is the largest shopping mall in the southern region of Israel, located in Be'er Sheva - the capital of the Negev. It features 220 stores.



Vulcan S250 outdoor installation: on the roof, with the sun most of the year. The temperature at this time was 38 - 40 °C. In winter, it is rainy and the wrap should be sealed to IP-68. Vulcan impulse bands were well wrapped and the Vulcan unit was in the outdoor box.



### The result after 5 months installation:

On the right is a cooling tower with Vulcan.

The differences are clear:

1. The **pressure difference is lower** between the exit and the inlet of the heat exchanger in the right tower.
2. The water coming out of the heat exchanger is **colder** in the right tower.



## Supermal Karawaci (4-Year Cooling Tower Test)

Indonesia



### 4-Year Field Tested of Vulcan for the Cooling Tower at Supermal Karawaci (SMK)



#### Installation details

<b>Model</b>	Vulcan S500
<b>Tested field</b>	Supermal Karawaci, Tangerang, Indonesia
<b>Operating times</b>	This large mall operates 7 days a week from 9:30 to 21:30, 365 days of the year
<b>Tested location</b>	One of 7 cooling towers servicing the mall's water cooled package air-conditioning systems. The cooling tower selected is a 408TR system containing 45 m <sup>3</sup> water volume with a water flow rate of 318 m <sup>3</sup> /h in an open circuit system.
<b>Testing period</b>	February 2014 - February 2018 (4 Years)
<b>Installed by</b>	PT Biosolutions Indonesia



Vulcan S500 was located inside aluminum box and installed on a cooling tower main pipe in Supermal Karawaci.

#### Inspections

The photographs show that the refrigeration condenser tubes, from the beginning to the end of the trial period, were "as clean as new".



**First Inspection: March 4, 2014.**

The heat exchanger tube plates were removed to reveal the inside surface of the copper tubes. Since these tubes had recently been manually cleaned, virtually no scale was present, as is obvious on this photo.



**Last inspection: February 12, 2018  
at the end of the 4-year trial**

The inside surfaces of the copper tubes show zero additional scale formation after 4 years in the test period.

Please note that for 4 years of 365 days continuous operation, there has been:

- No chemical water treatment.
- No bleed off of waste water.
- No cleaning of condenser tubes.
- No water treatment specialists employed.
- Copper tubes in the condensers stay very clean – without scale.
- No cleaning of the cooling tower inside surfaces.



### Inspections during the 4 years:

2014 - 4 times  
2015 - 2 times  
2016 - 2 times  
2017 - 1 time  
2018 - 1 time

### At each inspection, the following procedures were followed:

1. One of the refrigeration "Shell and Tube" condensers was opened and the tubes inspected.
2. Condenser tubes were photographed.
3. Cooling tower water sample was sent to lab.
4. Refrigeration hot gas pressure gauges were checked.

### Showing copper tubes of AC condenser heat exchanger on dates indicated:



First Inspection: March 4, 2014



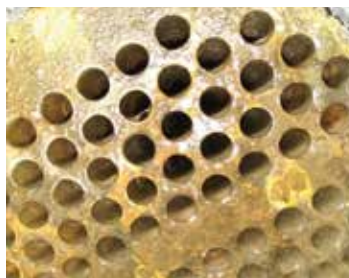
June 1, 2014



December 10, 2014



June 3, 2015



October 27, 2016



Inside of heat exchanger. Condenser end plate had lost all scale that was there previously. (Light spot at bottom is reflected light.)



August 3, 2017



Last inspection:  
February 12, 2018





### Significant findings as a result of the 4-year field tested trial:

- Scale build-up did not take place. During this 4-year trial period, no scale formation was found on the condenser heat exchanger copper tubes of the system.
- We have found conclusively that EC (Electric Conductivity) levels of up to 10,000  $\mu\text{S}/\text{cm}$  can be safely ignored. Similarly, high TDS, metals, anions and many other substances in cooling tower water can be ignored when Vulcan is used. Cooling tower water blow downs are vastly reduced because with the Vulcan the maximum EC limit increases from 1,200  $\mu\text{S}/\text{cm}$  in chemically treated cooling tower water systems to the much higher limit of EC 10,000  $\mu\text{S}/\text{cm}$  for the electronic method of cooling tower water treatment.

At the new 10,000  $\mu\text{S}/\text{cm}$  EC limit, the need for cooling tower water blow down will likely be reduced from almost daily to once or twice per year.

- No system maintenance was required.
- All AC compressors ran entirely at clean condenser efficiencies.
- R22 refrigerant gauges on all condensers remained at constant hot gas head pressure.



### Summary of Benefits:


- Large savings on **chemicals**. The complete elimination of chemicals in this cooling tower operation during the field test supports the fact that Vulcan is "eco friendly" and would meet the Leeds and Green Mark Building Criteria required for "Green Building" designation anywhere in the world. Enjoy the benefits of a world class, **sustainable and "Green" Cooling Tower!**
- Huge savings on **blow down** water consumption. Significant energy and water savings due to clean condenser tubes and no need for water blow downs below electric conductivity 10,000  $\mu\text{S}/\text{cm}$  levels with the electronic cooling tower water treatment system – representing alone a saving of virtually all previously wasted water due to blow downs.
- Savings on **payroll** – no operational stoppages required for condenser cleaning, less testing and fewer inspections needed.
- Savings on **supervision** – engineers appreciate the "set and forget" of this automatic water treatment system. Frequency of inspections and laboratory expenses for cooling tower water testing are reduced due to the safety and reliability of the electronic systems.
- Scale formation was eliminated. Refrigeration compressors operated at peak efficiency due to no scale in the condensers.
- Rust prevention in iron pipes is an added benefit of the Vulcan system.

## Marina Plaza Building

UAE



### Installation details

Location: Marina Plaza, Dubai, UAE  
 Model:  S500  
 Area: Main water pipe for cooling towers  
 Installed by: Ascardi Green Building Services LLC



### About Marina Plaza

A prestigious office location, just off Interchange No 5 on Sheikh Zayed Road, Marina Plaza forms part of the Dubai Marina Mall and Address Marina Hotel complex. The building has 165 inspiring office spaces for businesses; as well as five retail units. The location is perfect for occupiers to enjoy the nearby facilities of the marina in their spare time and the two metro stations, Damac Properties and Jumeirah Lakes Towers, are ideal for commuters.



### Benefits from Vulcan S500:

- ✓ Reduced chemical dosing and chemical costs. The dosing of scale inhibitor chemical was reduced from the initial 6 liters per day to 1 liter per day.
- ✓ Reduced scale formation.
- ✓ Loose and easily removable scale on cooling tower fills. Man power is reduced due to easy maintainability.
- ✓ Reduced AMC (annual maintenance contract) cost.



With Vulcan, scale becomes loose.



Scale and algae can be removed easily by a water gun.





## Energy Complex Office Building

Thailand



### Installation details

**Location:** Energy Complex Co., Ltd. (EnCo)  
Bangkok, Thailand  
[www.energycomplex.co.th](http://www.energycomplex.co.th)

**Models:** 1 x  S250  
1 x  X-Pro 1

**Area:** Before the condenser water piping system to treat all 7 cooling towers

**Installed by:** SGI Technology / Globen Engineering

### About Energy Complex



Energy Complex is the first office complex in Thailand and Southeast Asia to be awarded the highest level of Platinum Green Building certification from LEED (Leadership of Energy and Environmental Design) that serves as the prototypical building in Thailand for energy conservation, harmonious coexistence of industry and the environment and optimal utilization of resources.

### Installation purpose

Before Vulcan was installed, the client used ozone water system to treat the condenser, but they still found massive scales in the basin of the cooling towers. They collected the scales from the basins and weighed them, there were around 150 kg (average) of scales every month.

### The results after 4 months

Vulcan was added together with the ozone system to treat the water. After 4 months, the approach temperature of the chiller has been reduced, so that the energy has been saved from the machine. Also, the scales from the cooling tower basin have been reduced.



Vulcan S250 and X-Pro 1 were installed on the main return pipes of the condenser.



7 cooling towers were treated with Vulcan.



SGI Technology / Globen Engineering | (+66) 2004 6681 | [www.vulcan-thailand.com](http://www.vulcan-thailand.com)



## Tong-Cheng Travel Office Building

China



同程旅游  
Tong-Cheng Travel

**Installation Location:**

the headquarter building of Tong-Cheng Travel  
(Suzhou City, Jiangsu Province, China)

**Installed by CWT distributor:**

Jiangsu Xinriyuan Construction Energy Saving  
Technology Shareholding Co., Ltd.

**Model:**

1 x Vulcan S100



the headquarter building of Tong-Cheng Travel in  
Suzhou city, China

**Installation application:**

Tong-Cheng Travel is a Chinese tourism leading enterprise, CWT distributor- Xinriyuan took charge of the whole building air-conditioning works. The main part of the air-conditioning uses high efficiency evaporative system, and it requires very high quality water. To ensure the long-term efficient operation of the heat exchanger and also to avoid scaling occurred, Vulcan S100 was bundled with air-conditioning evaporative system.



main air-conditioning system



Installing Vulcan S100



Vulcan S100 was installed on the main air-conditioning system



## Fushang Residence Building

China



### Installation details

Location: Fushang Residence Building  
High-end residential community

Model:  1 x Vulcan S150  
1 x Vulcan S350

Area: Vulcan S150 was installed in the heating system in the low zone of the heat exchange station (below 6 floors); Vulcan S350 was installed in the heating system in the high zone of the heat exchange station (above 6 floors).

Purpose: To solve the scaling problem of the plate heat exchanger, to prolong the cleaning time and to improve the heat exchange efficiency.



Vulcan S150 was installed in the heating system in the low zone of the heat exchange station.




Vulcan S350 was installed in the heating system in the high zone of the heat exchange station.

# Crystal City Community

China

## Heating in Crystal City Community

### Installation details

Model:  Vulcan S250  
Location: Crystal City Community  
Area: Water inlet pipe  
Purpose: In order to solve the scaling problems for the heating system in the entire community. The heating area is 100,000 square meters.  
Installed by: Guangzhou A Fei Te



Crystal City Community

### Before installing Vulcan:

At the end of the heating period, the workers would make an annual cleaning for the heat exchanger plates. During the heating period, they are temporarily treated with a water softener.



Vulcan S250 was installed on the inlet pipe.

### After installing Vulcan for 4 months:

The heat exchanger plates were cleaned before Vulcan S250 was installed. During the period with Vulcan, the water softener had not used also without any other water treatment. After the end of the heating period, the heat exchanger plates were opened and still clean.



Without Vulcan treatment, the scale was removed after the end of the heating period.



After installing S250 for 4 months, the heat exchanger plates were opened and remained clean.



## Poultry Farms

Morocco

### The Cooling Systems in the Poultry Farm



#### Installation details

Location: 3 chicken farms in Morocco

Area:

- 6 cooling systems
- Drinking water of hens

Model:  S10

Result: The customer built the new cooling tower pads to test the Vulcan effects and compared the old pads which had not been cleaned for more than 5 years.

After Vulcan had been installed for 2 weeks:

- For the new pads, the new scale formed like powder, and it can be eliminated very easily.
- For the old pads, it took longer time to clean the old scale with a water gun.

Installed by: STE ETCT INDUSTRIE



Vulcan S10 was installed in the water main to treat 6 cooling systems in 3 chicken farms.



Without any water treatment, the scale was hard like stones, which had not been cleaned for more than 5 years.



After Vulcan S10 had been installed for 2 weeks, the old scale had been softer, and the new scale had formed as powder. The new scale was easy to clean, and the old scale took more time to clean up with a water gun.

See the video here: [www.bit.ly/ma-poultry](http://www.bit.ly/ma-poultry)

## Cost Savings for Cooling Towers

Japan



### Savings for cooling tower with Vulcan

#### Installation details

Model:	Vulcan S100
Installation Area:	cooling tower for 100RT turbo chiller, 24-hour yearly operation
Circulation Water Capacity:	120 m <sup>3</sup> /h
Pipe Diameter:	150 mm
Effect:	chemical treatment reduced

#### Full Chemical-treatment vs. Vulcan-treatment Indicates:

**Under 1 year**, with Vulcan treatment is already less costly than full chemical treatment

#### Cost reduction by Vulcan 25-year warranty:

	without Vulcan	with Vulcan S100	savings
	water and electricity charges	water and electricity charges	
	sterilization / anti-algae products	sterilization / anti-algae products	
	anti-scale chemical treatment		
	maintenance cost		
1st year	39,902 USD	35,386 USD	4,516 USD
2nd year	79,804 USD	66,541 USD	13,263 USD
3rd year	119,706 USD	97,696 USD	22,010 USD
5th year	199,510 USD	160,006 USD	39,504 USD
10th year	399,020 USD	315,781 USD	83,239 USD
25th year	997,550 USD	783,106 USD	214,444 USD

#### Further benefits

**Electric saving:** about 5-15%, by the scale prevention on the turbo chiller

**Gas saving:** about 5-25%, by the scale prevention on the absorption chiller

**Equipment life extension:** about 30-60%







**Coca-Cola**

**CHRYSLER**

**Heineken**

**INTERCONTINENTAL**  
HOTELS & RESORTS

**DAIMLER BENZ**

**MÖVENPICK**  
Restaurants

**BAYER**

**McDonald's**

**Nestlé**

**SWAROVSKI**

**Shell**

**HYATT**  
**HYUNDAI**



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