

An Overview of the Product and its Applications



Made in Germany

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Introduction

Avoiding “Scale” in water circuits (pipes) and equipment attached to these circuit, remains an on-going challenge for industry.

Solutions proposed are many and diverse.

The objective is to control the scaling process whilst at the same time minimizing the economic and environmental effects associated with cleaning and maintaining these pipes and equipment.

Currently the most common treatment for both “Scale” and “Corrosion” control is the use of chemicals. A wide range of chemicals and even common salt (sodium chloride) is employed.

To augment/ reduce the demand for chemicals, physical treatment techniques have been considered.

Thus, high frequency, electrostatic, magnetism and electromagnetism techniques, osmotic procedures, etc., have been developed.

The importance of “scaling” in the development of corrosion and biofilms in water circuits, as well as its negative impact on energy consumption in conjunction with environmental pollution as a result of using traditional chemical regimes, has been a key driving factor in the continuing development of physical treatment devices. Physical water treatment represents the next step in water conditioning, not water treatment with chemicals.

Some, techniques such as magnetism, although much heralded, have been found to have limited success and do not deliver the flexibility required to address the many varied parameters at play (water temperature, duration of effect, length of water circuit to be protected, materials making up water circuit, water composition).

There have been many exaggerated claims and disappointments as “New” Physical water treatment devices have entered the market, promising much but with limited success. **Sialex® Ring**, we believe, is the next generation in physical treatment devices, developed in Germany and with more than 10 years of successful applications worldwide, the product delivers where others have failed.

Sialex® Ring first entered the market since early installations in 2006.



Here we focus on **Sialex® Ring** when used in the control of water related “Scale “and Corrosion”.

Sialex® is a “scalable” process. **Sialex® Ring** is available to fit small diameter pipes with low flow rates to large industrial pipes with very high flow rates. The objective; to control lime scale and rust in water pipes and devices attached to water circuits.

Sialex® systems are installed in industry, manufacturing and private homes. **Sialex®** devices do not suffer from performance limitations associated with “magnetic” devices or most other physical systems.

In the past years/decades there have been countless investigations into the “Application of magnetic fields in the control or treatment of lime scale”. Results are somewhat contradictory.

Under certain conditions (low flow and specific magnetic properties), it is possible to achieve positive results.

However, performance inconsistencies are a constant concern when using such products (magnetic devices). Unfortunately, such limitations are not always highlighted when presenting these devices and expectations of success quickly turns to failure and disappointment. The “overselling” of these products has, to this day, continued to prejudice the market to all physical water treatment techniques.

Aware of this, we have chosen to introduce **Sialex®** products in a controlled manner. We have gained experience in industry, manufacturing, housing construction societies and private households, both nationally and internationally. We do this carefully to build a successful track record.

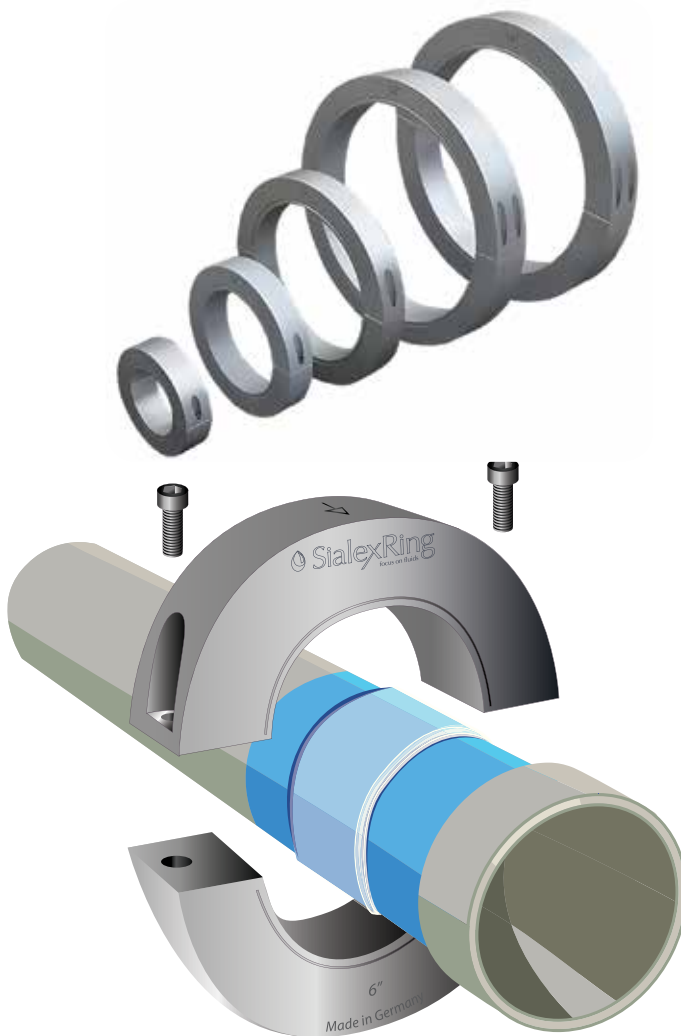
Sialex® Rings work on almost any pipe material; they are not limited to metal pipes.

Sialex® Rings work with a wide range of water hardness values, and can handle water flow rates from that of a family home to high flowrates required by heavy industry.



Product Overview

Sialex® Ring is simple and functional in design. Rings are formed from a predominantly aluminum / silicon alloy. The device consists of two semicircular pieces and their locking screws. The Ring is installed around the external circumference of a pipe.



Sialex® Ring, in addition to the standard “bracelet” appearance, are also manufactured for specific applications, as is the case with commercial coffee machines.

The technology will accommodate most water flow rates and water pipe dimensions (ranging from ½” to 80” o.d.). Rings are designed for use on most pipe materials (ferrous and non-ferrous).

Devices are easy to install, and require no special tools.

Depending on flow rate and diameter of the pipe, the rings are available in three options:

- **CLÁSSIC**
- **INDUSTRIAL**
- **OPTIMUM**

Determining which version to employ is described later in this document.

Operating Principle

Sialex[®] is a processing technique, employed to create a range of products used in the control of scale and corrosion.

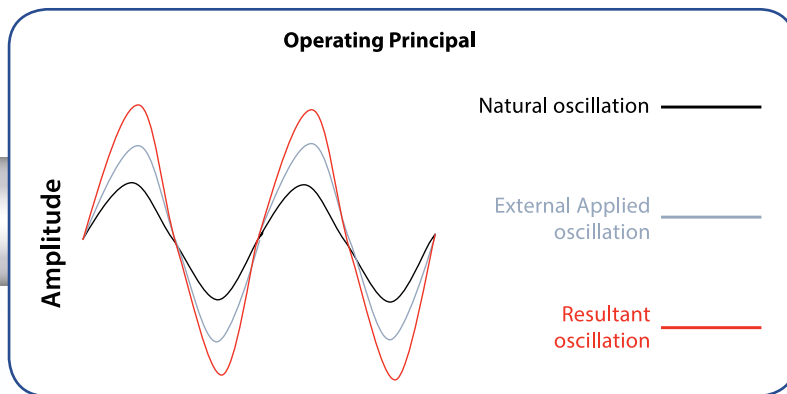
An initial family of “**Sialex**[®] **Ring**” products designed for easy installation onto existing water circuits, provides protection against scale and corrosion, and additionally helps reduce algae and biofilm-related materials.

Solid molecules are tightly packed, liquid and gaseous molecules are relatively more fluid and constantly moving.

This motion of molecules occurs at given frequencies. Materials have a unique characteristic vibration/oscillation (at subatomic level).

An external influence is applied to the water, in phase with its natural frequency.

Water molecules, and other compounds present in water, begin to oscillate at a modified amplitude (resonance)



In medicine, MRI systems use this principle to create a 3D image of the human body.

Sialex[®] **Rings**, using a proprietary technique, deliver a set of “oscillations / signals” into water held in / transported through a water system.

Due to the wide range of materials that may be present in water chemistry, a wide range of signals are encoded onto **Sialex**[®] devices.

Simply, **Sialex**[®] devices operate by exerting influence on chemical bonds, preventing the formation of “Scaling”, and encouraging the process by which water transports “Scaling” material in the first instance.

This effect gradually eliminates pre-existing scale, in place prior to **Sialex**[®] **Ring** installation.

Sialex[®] **Rings** address “Scaling and Corrosion” problem areas such as boilers, cooling towers, steam condensers, heat exchangers, pumps etc. and by extension offer “Scale and Corrosion” control to the water circuit.

Devices are employed in HVAC and Refrigeration systems as well as a many other water related, industrial applications.

Installation

Sialex® Ring installation requires minimal site preparation.

Devices are installed in a clean, dry location. A “Protective” cover helps protect the device from environmental damage.

Sialex® Rings are installed on almost all pipe materials.

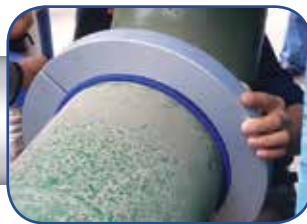
To select a suitable **Sialex® Ring**; Undertake a water circuit “Audit” identifying key components and critical equipment.

Select the correct “mix” of **Sialex®** units to be installed where needed.

Confirm pipe outer diameter (o.d.) at the installation point(s).

Confirm the maximum flowrate through the pipe(s) (cubic meters/hour).

Sialex® Rings are installed at locations free of excessive electrical interference (ex. electrical motors, pumps, high voltage sources).



Where water is used to transport energy (heat), heat exchangers are commonly employed. “Scaling” is associated with the “cool” water circuit of such devices. To deal with this problem, **Sialex® Rings** are installed on the “Cool” side of such devices.

Identifying critical “Scaling” sites, measuring pipe outer dimensions (o.d.), and confirmation of flow rate through such pipes, allows specific **Sialex® Ring(s)** to be identified for installation.



The Sialex[®] Ring Family

There are three models of Sialex[®] Rings

CLASSIC Sialex[®] Rings are employed in residential and “light” commercial applications. Classic Rings are available to install on small diameter pipes with limited “flow rates”.

INDUSTRIAL Sialex[®] Rings are available to install on a wider range of outer diameter (o.d.) pipes and are designed to meet more demanding / “medium” flow rates (water) applications.

OPTIMUM Sialex[®] Rings are available in all standard dimensions and address the “heaviest” of water flow rate needs. Optimum **Sialex[®] Rings** are provided as a “Syn-Ring” configuration (a two-unit configuration).



Example Applications

Sialex® Ring is installed in many applications including:

- Cooling water / towers (Scale and corrosion control).
- Scaling in water bearing pipes.
- Rust/corrosion in water bearing pipes and equipment.

Although initial applications of **Sialex® Ring** have focused on “water” related issues, fluids such as petroleum/ water mixture, dairy products etc., are further examples of **Sialex®** versatility.

Sialex® Ring offers superior performance while reducing energy consumption, in applications requiring transportation of water (hot / cold) energy by means of water pipe circuits. In addition, **Sialex® Ring** contributes directly to extended “system availability”, reduction in maintenance and extended component “life (condensers, towers, pumps, heat exchangers etc.) incorporated into the **Sialex® Ring** protected water circuit, in hard water environments.

Sialex® Ring is a versatile, powerful, “Scale and Corrosion control” system. Where to apply, what to apply etc. requires planning. A balance of system capabilities and application needs is required. “Problem” areas/ equipment should be identified and a system map created.

Sialex® Ring works on water but does not modify it. The chemical composition of water remains unaltered, after passing by the device. The units are ideally suited to food processing and other processes where “Scaling” is a problem but chemical contamination is a concern.

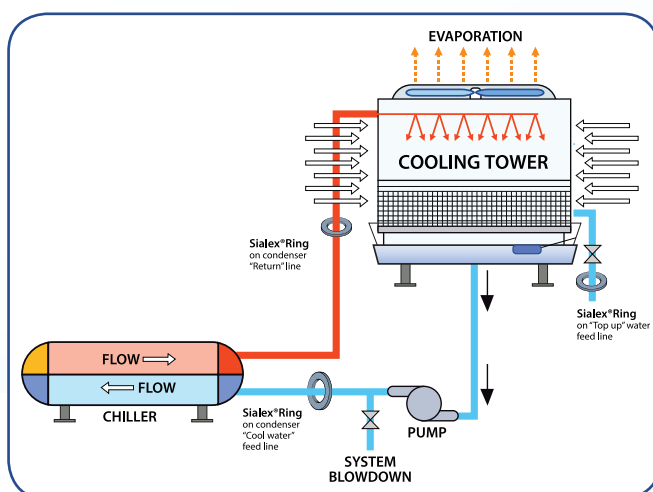
Sialex® Ring’s optimal operational window is described as between 0 °C to 150 °C, although they will operate up to temperatures of 200 °C.

Heat exchange systems (shell and tube condenser, and cooling tower), require replenishing water, lost to evaporation or “wind drift” as heat is dissipated through the cooling tower.

Heated water, carrying excess heat from a system, is delivered to cooling towers where it is distributed over the heat transfer surface (cooling vanes).

Air is introduced/forced through heat transfer surfaces. Heat transfer causes some water to evaporate or to be lost in the form of spray/ vapor.

This evaporation process removes heat from this returning water, which pools in a water collection basin before re-introduction to the water circuit.



Installation of OPTIMUM rings in heat exchangers

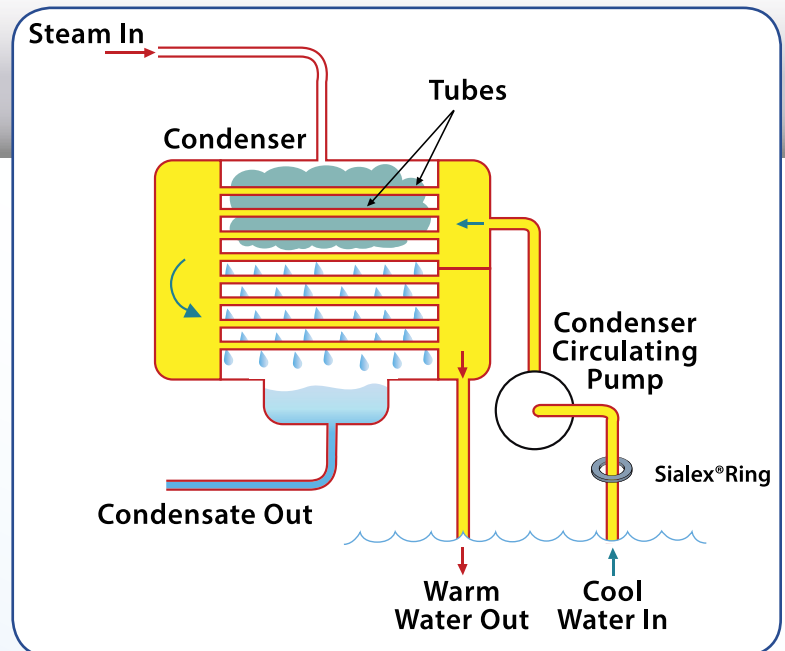
Installation of OPTIMUM rings on heat exchangers



*Water Condensation
Condenser: A heat
exchanger is used to cool
steam. Steam can be
converted to liquid by
increasing the pressure
without reducing the
temperature.*



DN700 Sialex® Ring on condenser unit





Appendices

Appendix 1:

Sialex[®] Ring system in a machine room

Appendix 2:

Cheese production facility

Appendix 3:

Cardboard production facility

Appendix 4:

Airport HVAC system

Appendix 5:

Brewery installation

Appendix 6:

Solar powered water heating installation

Appendix 7:

Hot water boiler installation

Appendix 8:

Before and After **Sialex**[®]

Appendix 9:

The Problem and the Solution

Appendix 10:

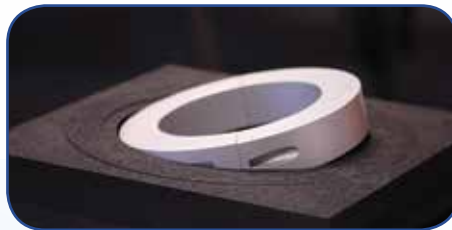
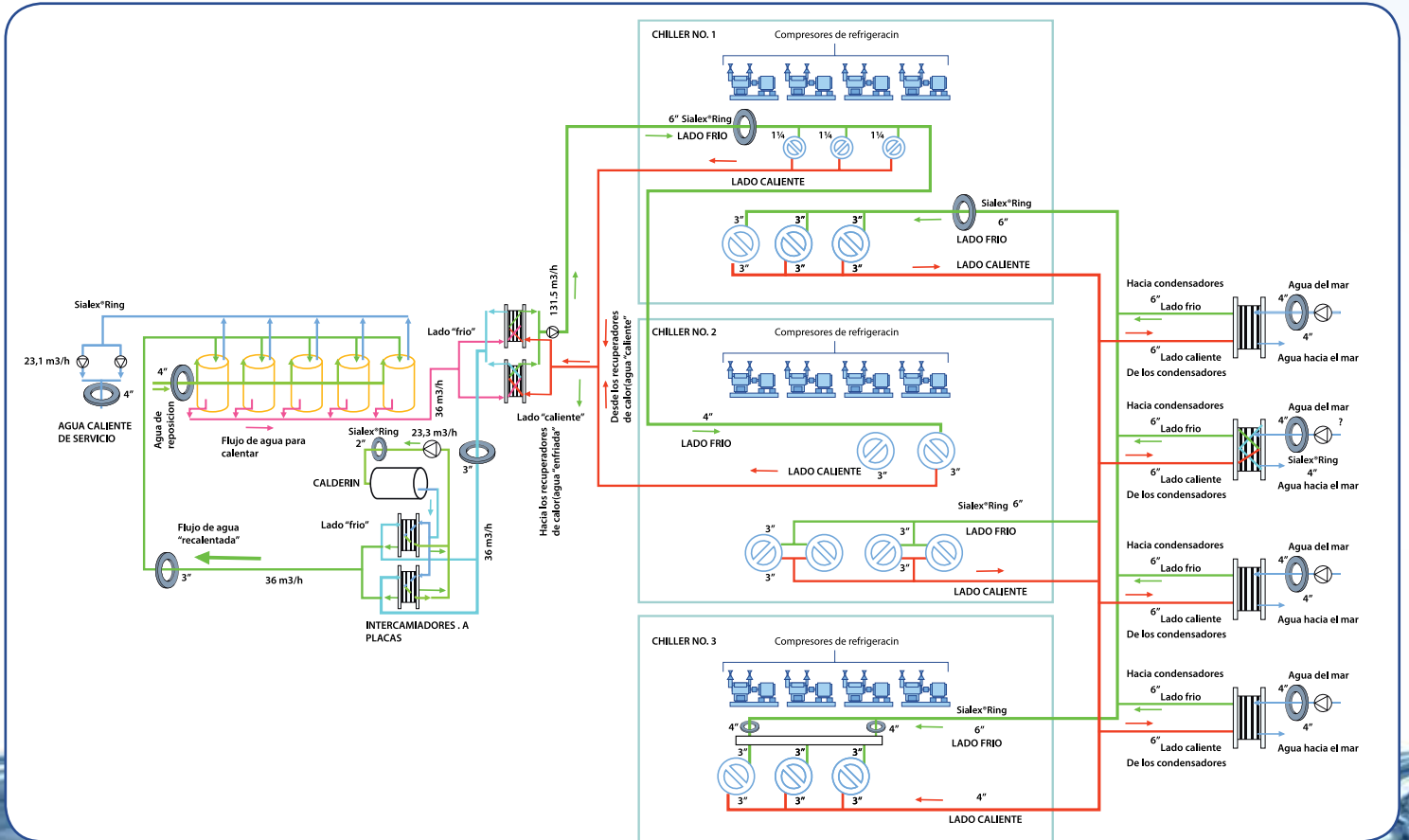
Sialex[®] clients

Appendix 11:

Some key points

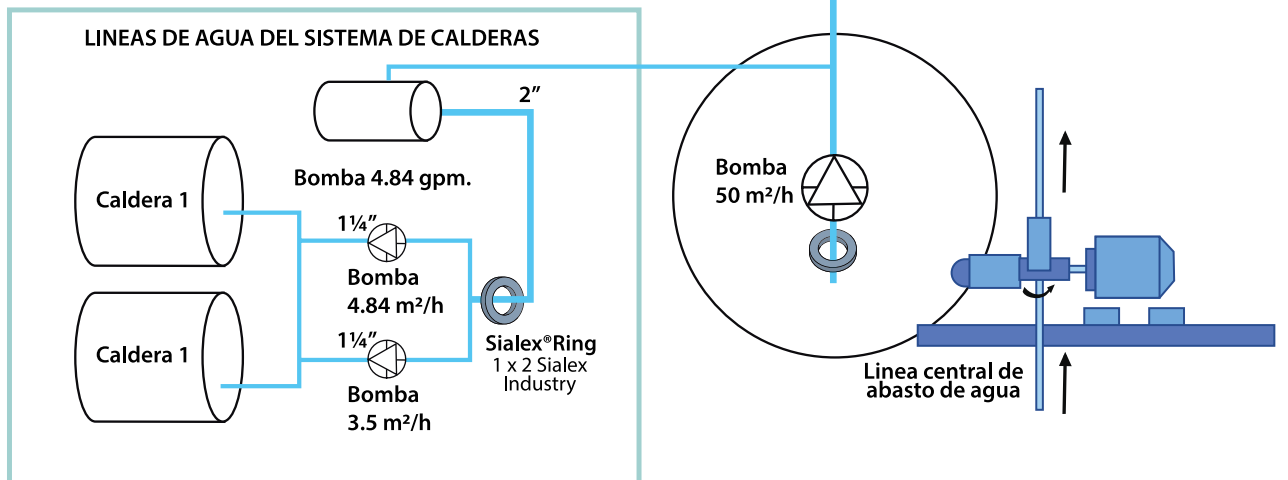
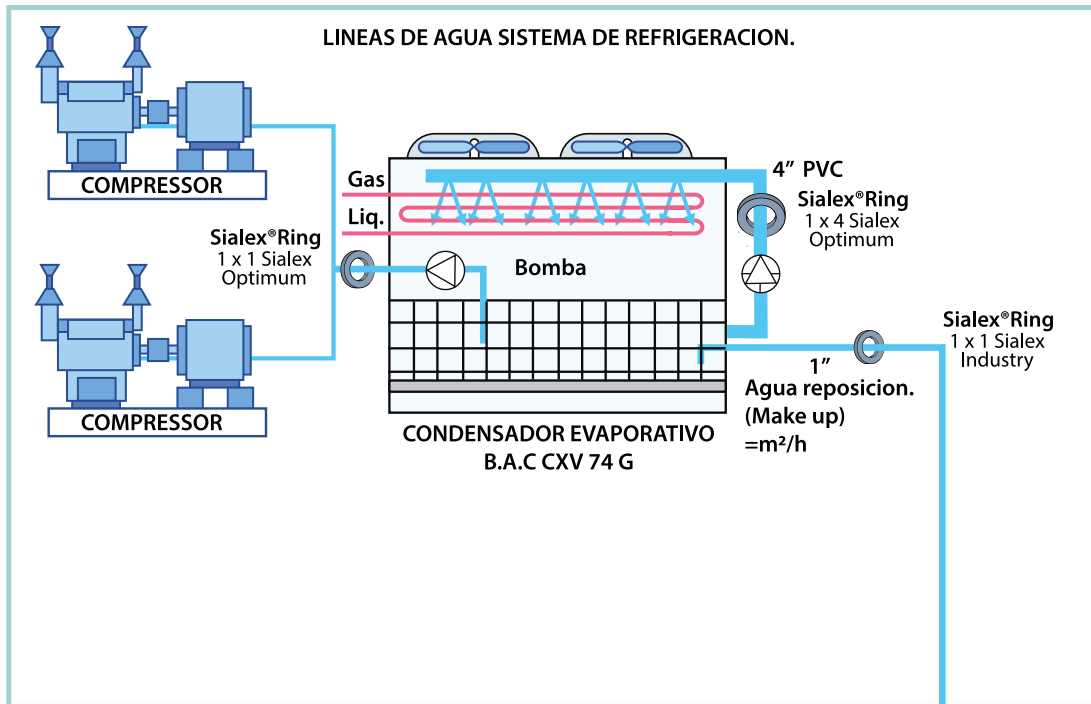
Appendix 1

Sialex® Ring in an machine room (Hotel).



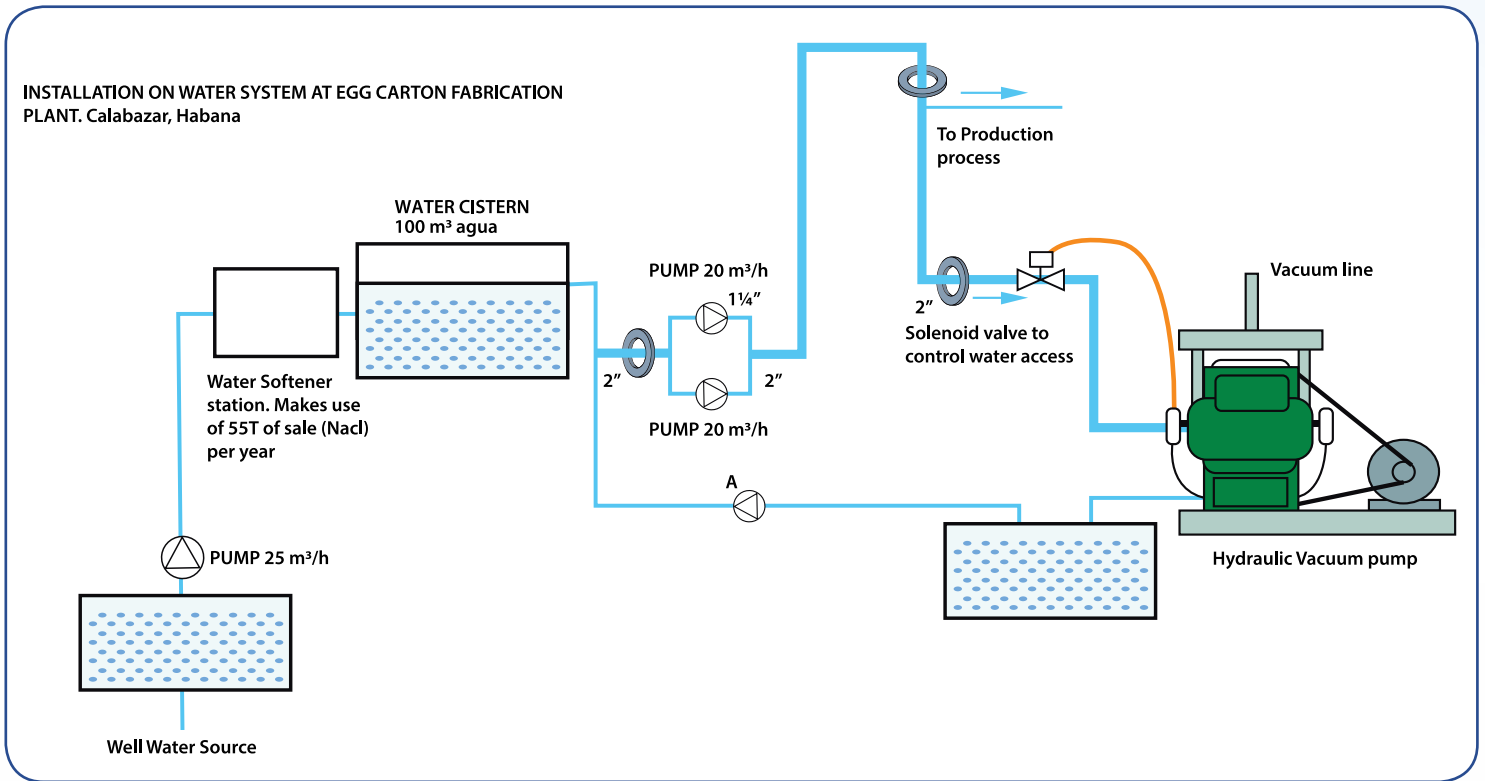
Appendix 2

Sialex® Ring system installation on a refrigeration system and boilers (cheese production facility).



Appendix 3

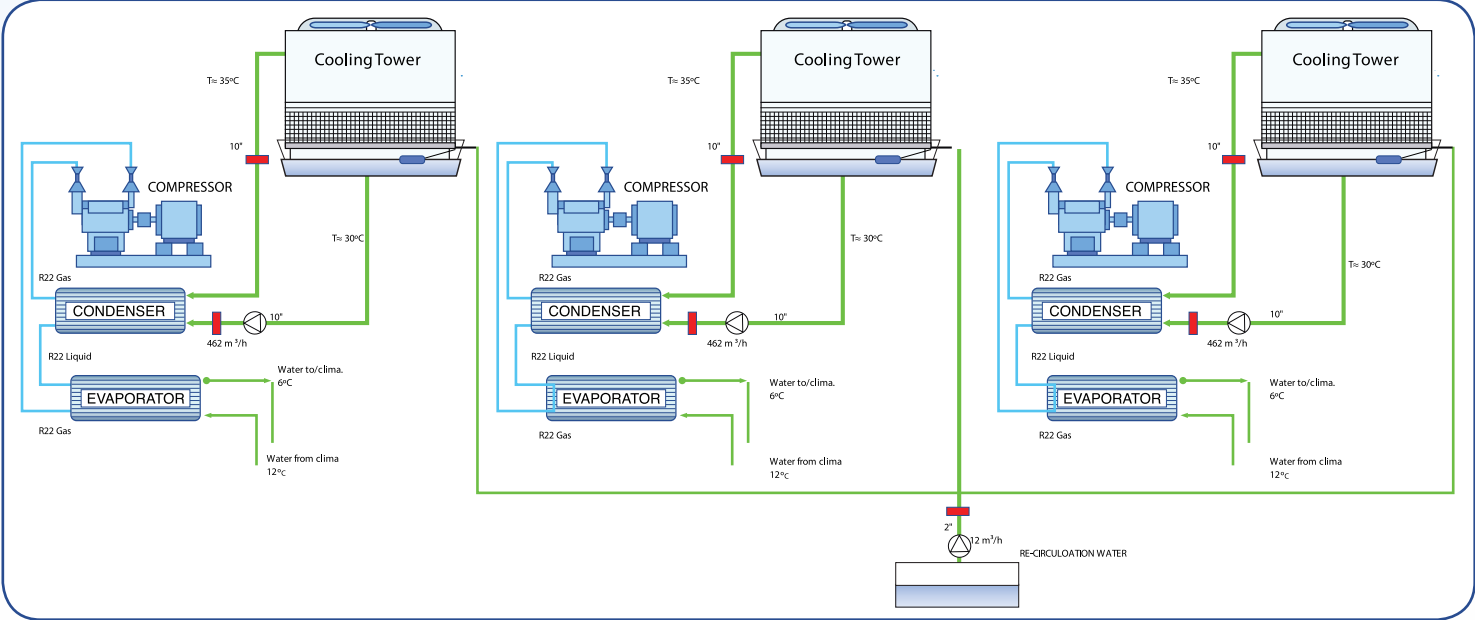
Sialex® Rings system in a cardboard production plant.



Appendix 4

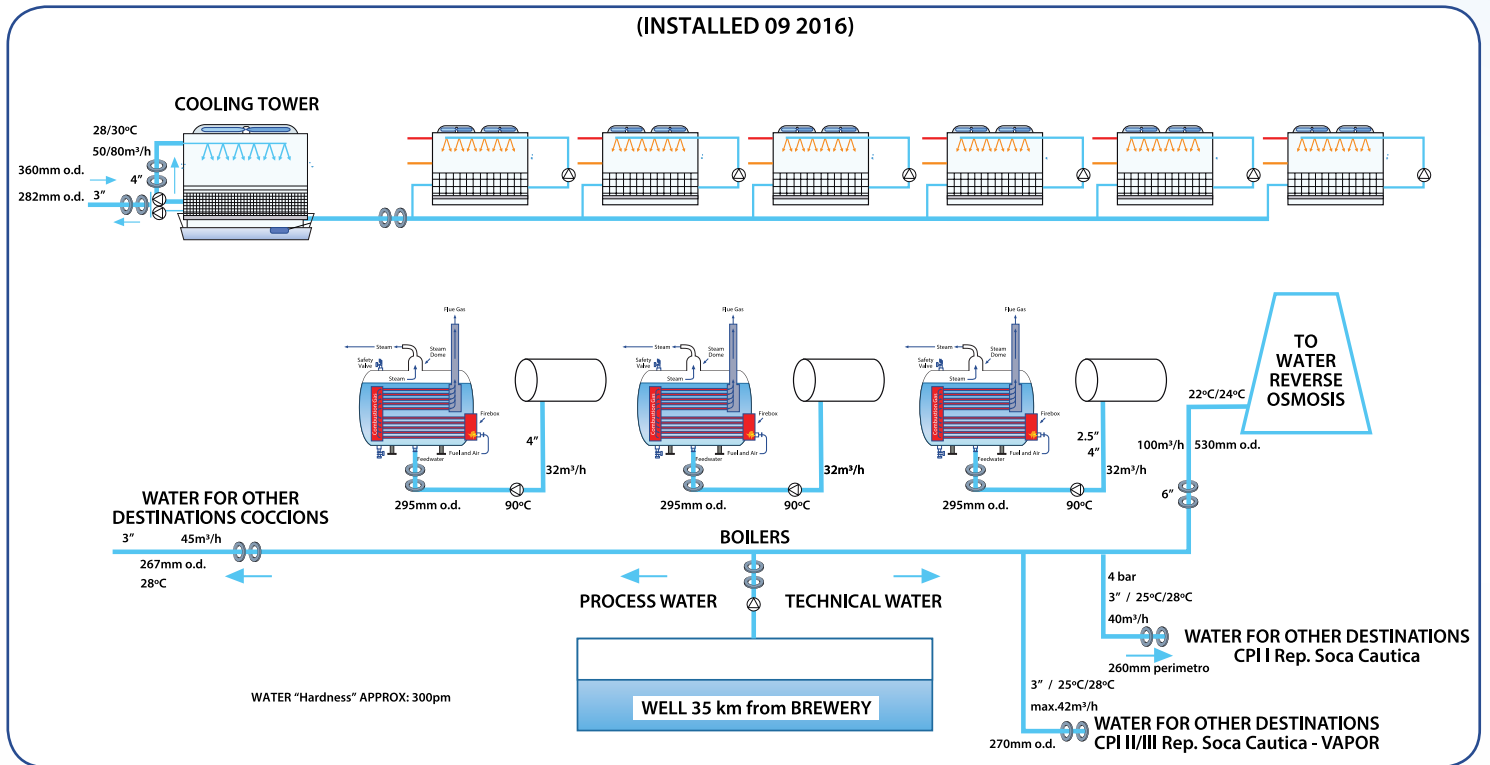
Installation of Sialex[®] Rings on centralized air-conditioning system, supplying chilled water to office buildings, on three (3) separate water circuits.

Air terminal in Cuba



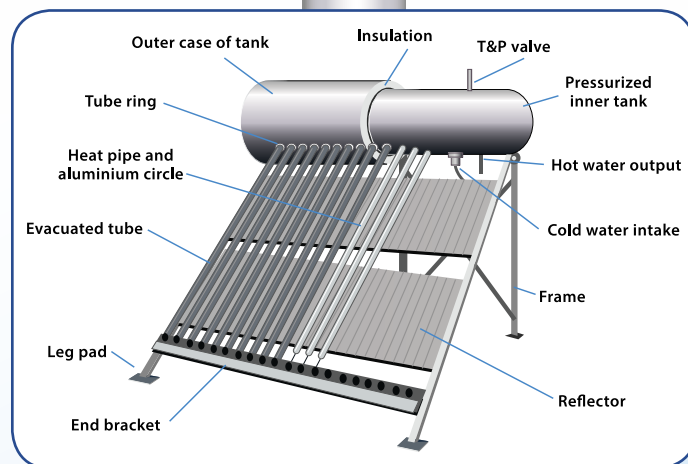
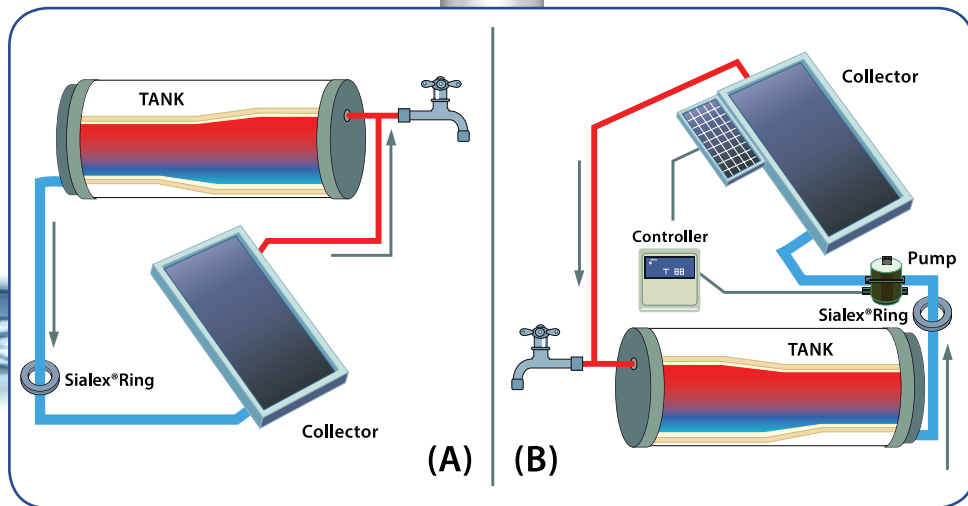
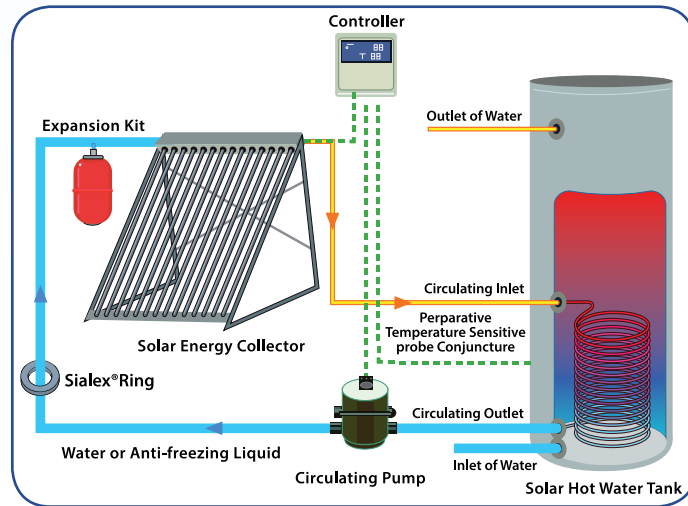
Appendix 5

Sialex® Rings in brewery installation



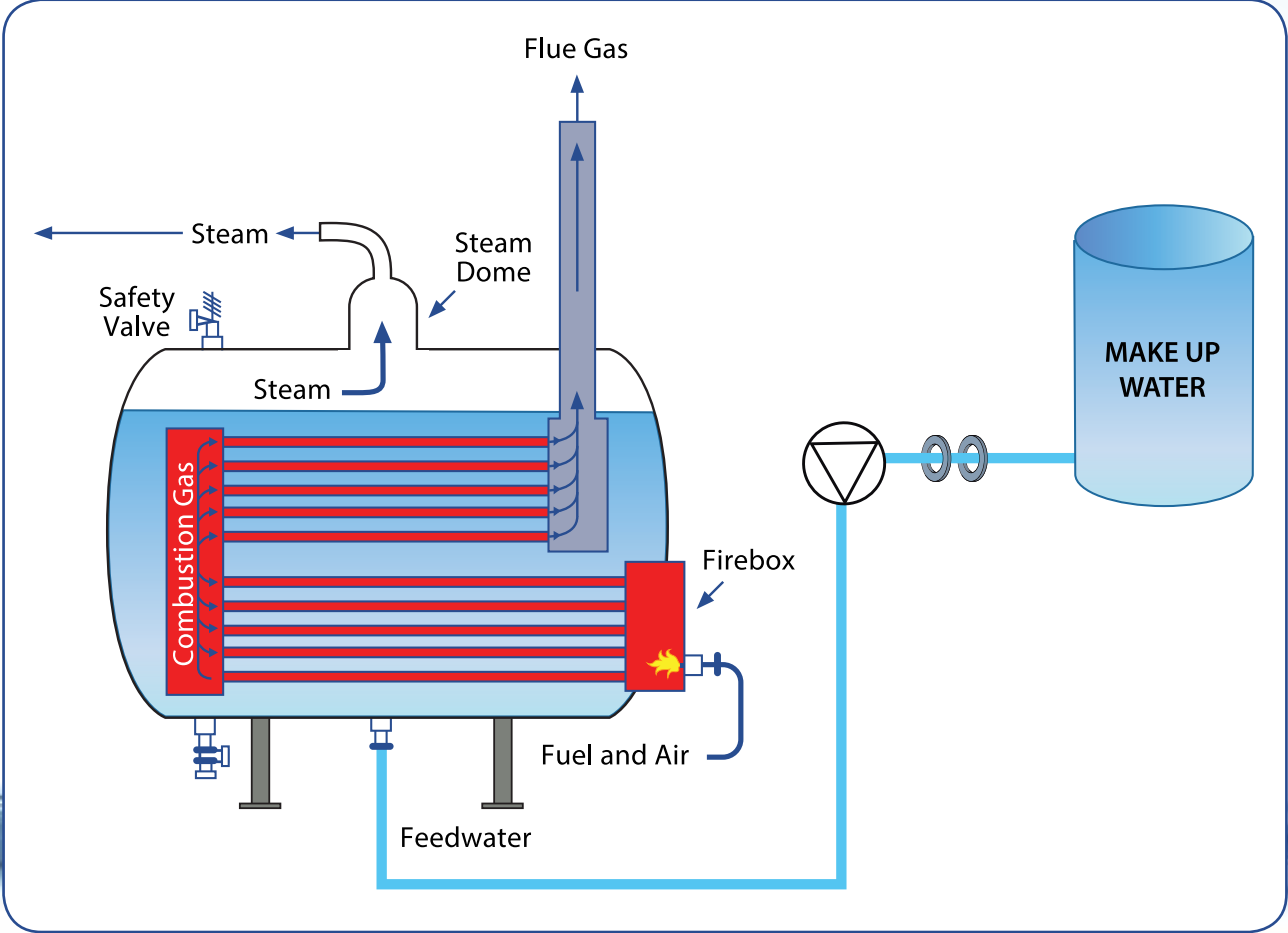
Appendix 6

Solar powered water heating installation



Appendix 7

Hot water boiler installation



Appendix 8



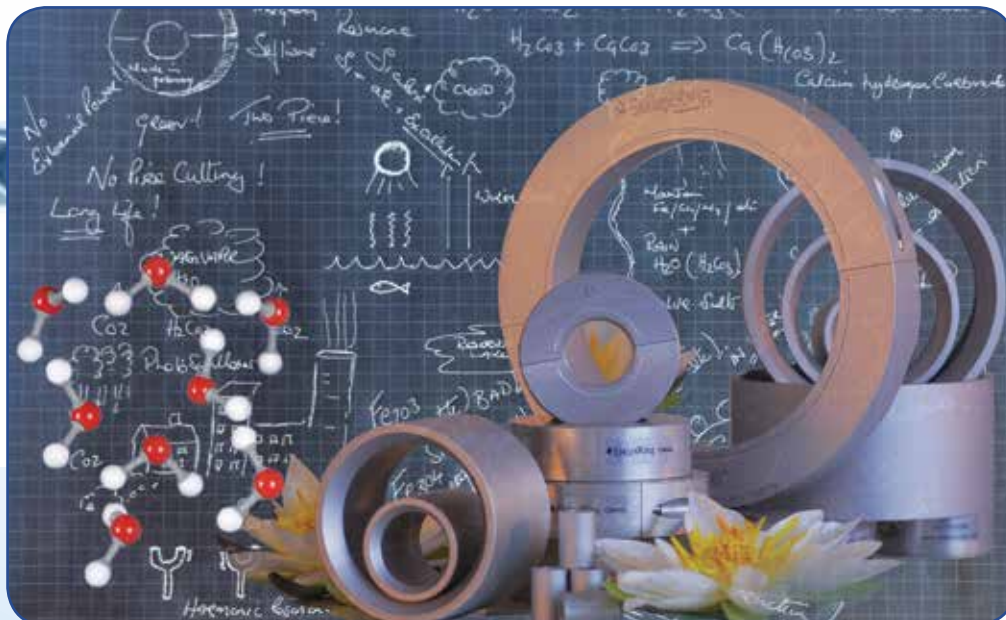
Before and after Sialex[®]

Appendix 9

The Problem

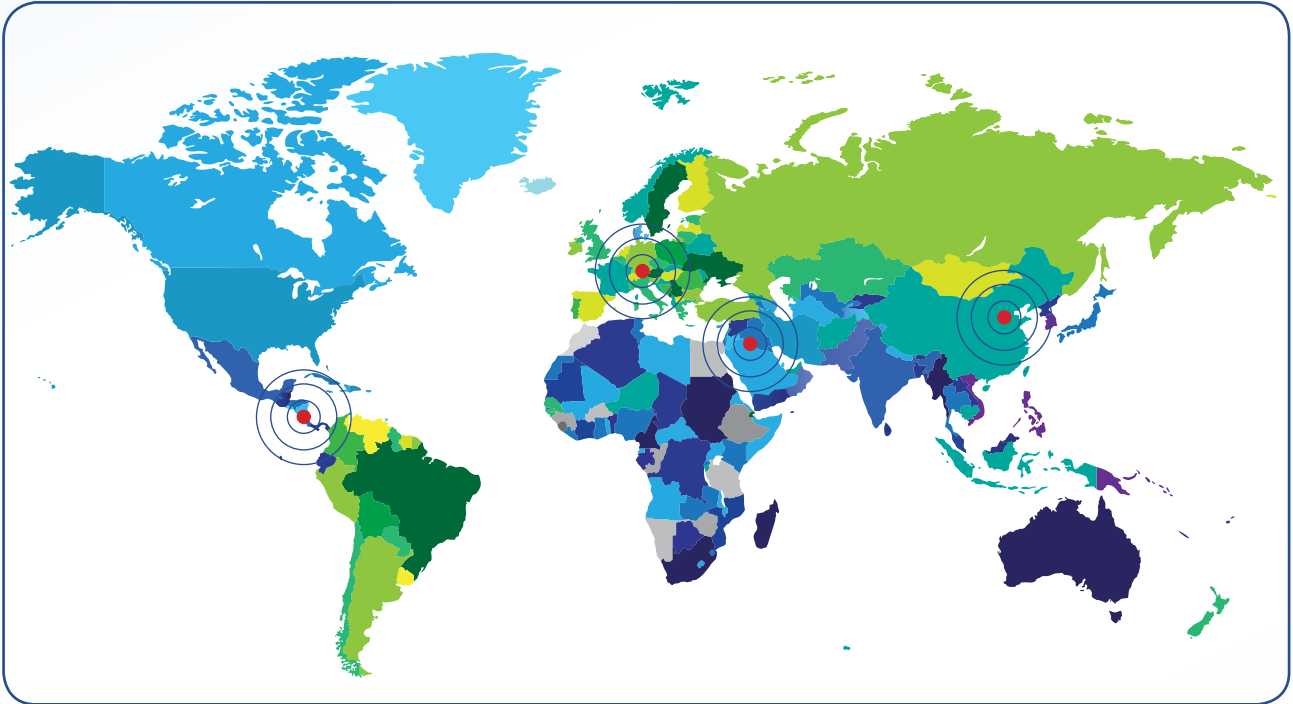


The Solution



Appendix 10

Sialex® Ring customers



Warranty

Sialex® Ring is supplied with what we, Phoenix, believe to be a superior manufacturer's warranty when compared to more traditional water treatment systems.

The "Warranty Period" provided to the Customer extends to a total of "5 years" from date of installation, provided the units in question are supplied and installed by Phoenix Ring Manufaktur, or by a distributor / representative officially appointed by Phoenix Ring Manufaktur and approved for the installation of **Sialex® Rings**.

Authorized representatives work together with the customer to ensure that the **Sialex® Ring** operates in accordance with the specification. In the unlikely event **Sialex® Rings** may require attention the local sales partner will liaise with the client.

Should it be determined that a **Sialex® Ring**, during the initial 90 days from installation, as determined by the local **Sialex®** sales partner, requires "Re-charging", the unit will be returned for "Re-charging" at no cost to the End User.

Appendix 11

Points for consideration:

1. **Sialex® Rings** work against “Scale and Corrosion in water circuits and devices attached to these.
2. **Sialex® Ring**; both preventative, as well as remedial action.
3. Installations (pipelines, equipment, etc.) already in operation may exhibit “fouling problems” not solely related to Ca and Mg salts such as hair, grease, foreign bodies etc. In such cases, obstructions may occur despite the efficient working of the ring,
4. Older installations where “scaling/corrosion” has been a problem for several years, may require exposure to **Sialex® Rings** in larger numbers or for a greater time.
5. The decision on the type and location of rings, will always respond to the criteria and technical knowledge about them, and the system where they will be applied.
6. In the case of industrial/commercial clients; although water at first glance, appears a generic product, and “Scale and corrosion” maybe perceived as generic problems, this is not strictly accurate. Each customer/installation should be reviewed by Phoenix or our approved sales partners to ensure a valid solution is proposed.
7. Examples illustrated maybe used as indicators, but not as binding proposed solutions. Actual water circuits and equipment installed (cooling towers, condensers, etc.) determine the proposed **Sialex®** solution. Examples should be considered indicators only.





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