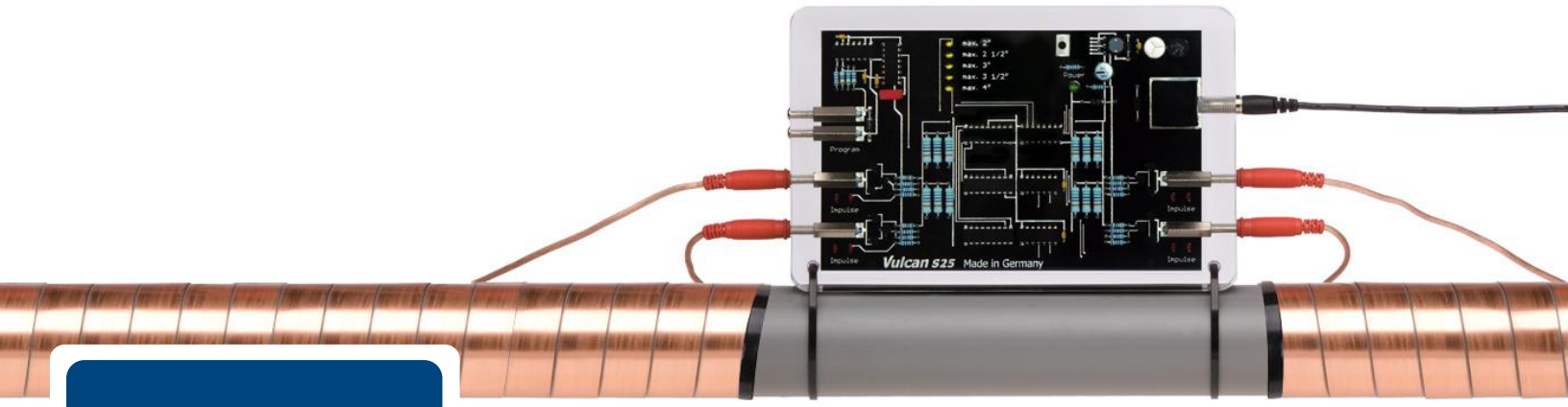
Remove And Prevent Mineral Scaling in Water Based Building Equipment



Vulcan
Descaler

40+ years of greentech water treatment advancements with energy saving and equipment lifespan benefits

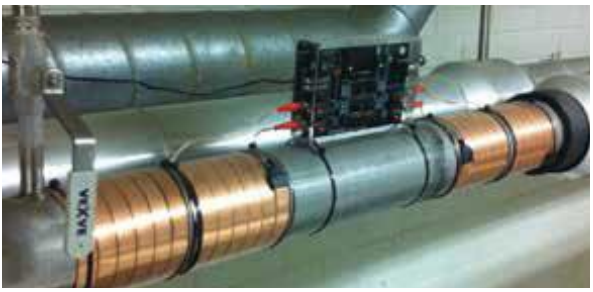
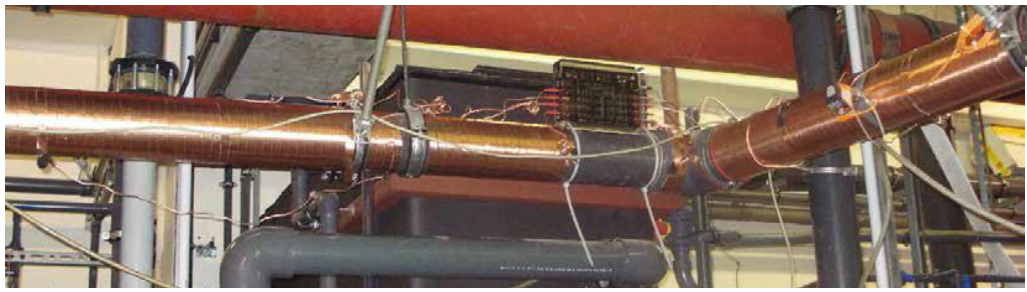
WASLIX WATER

CLEARLY CLEAN

GREENTECH Mineral Descaling Solution

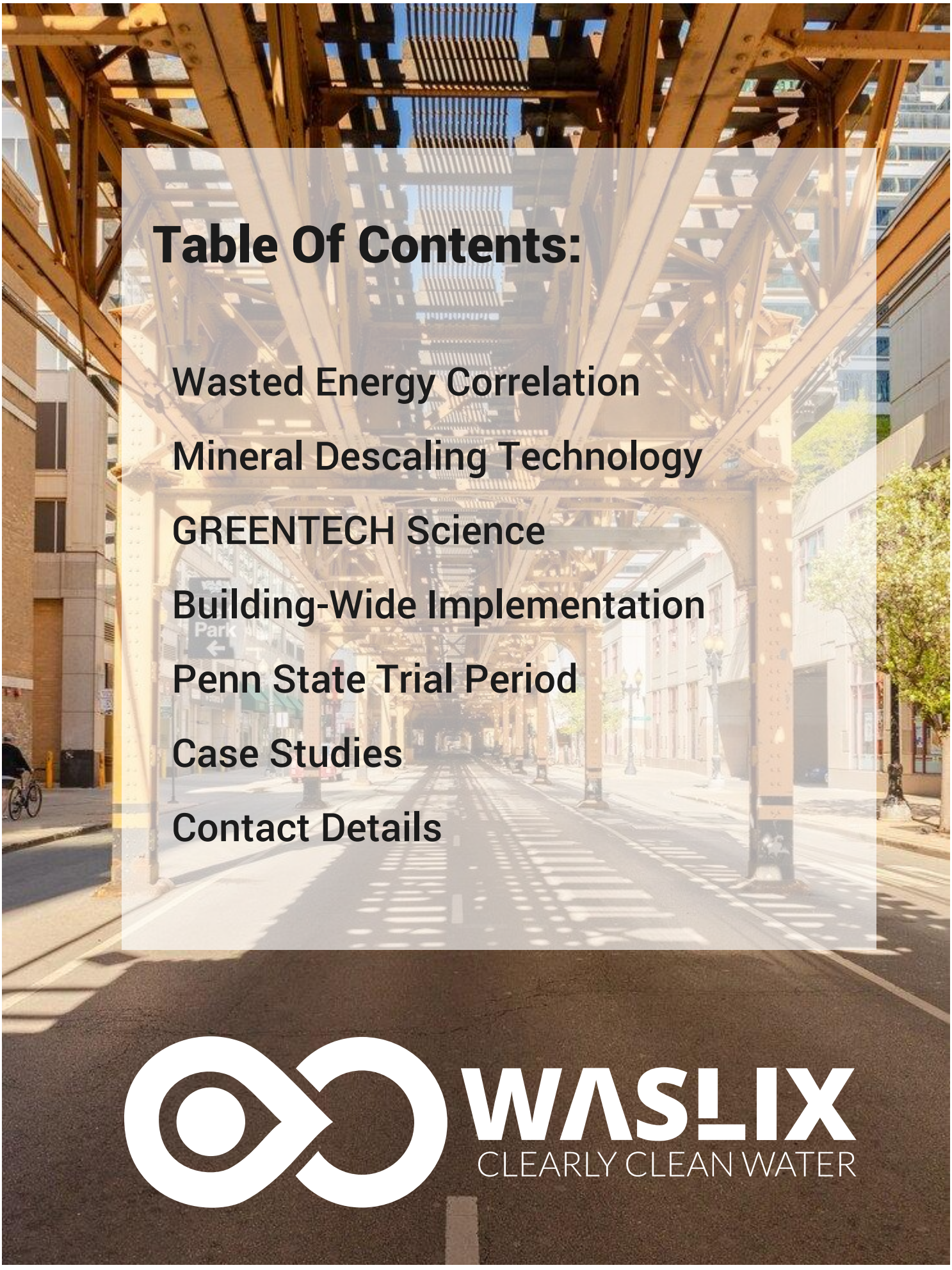










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WASLIX

CLEARLY CLEAN WATER

> Mineral scaling is the established and recurring imbalance between water in the natural world and our modern built environments. Scale deposits typically go unnoticed until there is a crisis to resolve in a blocked pipe, repair or replace equipment, or now during the sustainability and energy movement to **implement positive environmental changes.**
>
> *Pierre Jordaan (Waslix)*

Correlation between minerals in water and wasted energy consumption

Water minerals are rapidly pulled out of solution during heat and pressure changes as water flows in pipes, equipment and throughout a building. These minerals quickly bond to each other and onto surfaces; coupled with suspended solid impurities, microscopic particles and debris, causes mineral scale layers to grow in thickness as a solid insulator.

This insulator causes an increase in the thermal resistance and leads to reduced heat transfer rates and increased energy consumption.

our technology has been in active development for over 40 years
NO salt, resins, chemicals, magnetic fields, or byproduct consumables

Chemical based water treatments embrace the old status quo to treat scaling issues while France and China lead the adoption of sustainable mineral scale treatments

WASTED ENERGY CONSUMPTION

water minerals have impact on building equipment and energy

The investigation found that mineral scale directly impacts energy usage; equipment performance and longevity.

Date: November 2013
SH Widder and MC Baechler
Source: Pacific Northwest National Laboratory, Operated by Battelle for the United States Department of Energy under contract DE-AC05-76RL01830

1 mm scale deposit layer increased energy consumption by more than 15% in electrical heaters

Dobersek and Goricanec, 2014

Energy is lost because the precipitated scale has very low thermal conductivity on heat-transfer surfaces.

Dobersek and Goricanec, 2014

Corrosion cased by mineral scaling has shown to decrease equipment life by more than 50% if not properly mitigated.

Weingarten and Weingarten 1992

NYC Local Law 97 mandate is to reduce greenhouse gas emissions by 80% by 2050. Property Owner's failure to meet NYC milestone goals will incur financial penalties.

PROUD SERVICE PROVIDER
NYC ACCELERATOR

Our **greentech** has a strong history of success across 70 countries, multiple industries and building types over the past 40 years

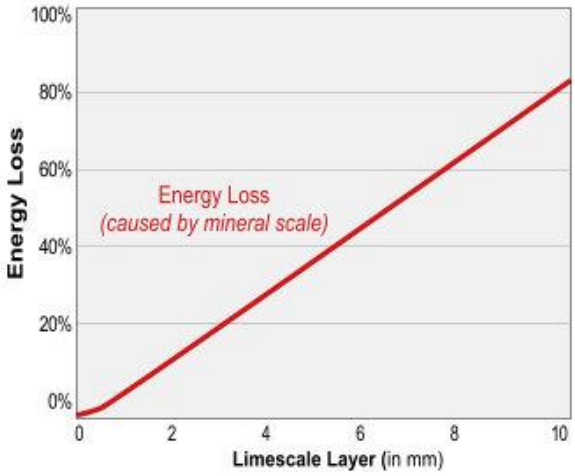
Proprietary Oscillating Impulse Frequency technology disrupts and changes the molecular structure of scale causing minerals into smooth rod-shaped crystals to remove and prevent scale deposits.

BOILERS, HEAT EXCHANGERS, COOLING TOWERS & MORE

Decades of scale layers are gently removed with the natural water flow; out of equipment and away from a building.

HEAT EXCHANGERS, COOLING TOWERS, BOILERS & MORE

Heat and water pressure accelerate the precipitation of calcium, magnesium and other minerals out of solution; our tech prevents these minerals from bonding to surfaces.

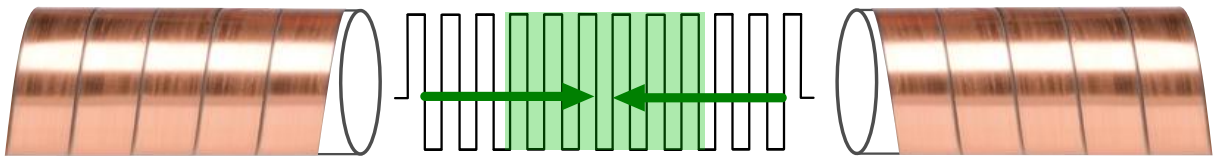


New building equipment and parts provide a short term energy saving benefit; while **preventing mineral scaling with our greentech provides continuous descaling benefits** with no additional labor, parts, or environmental consumables.

NYC Sustainable Buildings

"Local Law 97 is one of the most ambitious plans for reducing emissions in the nation."

GREENTECH Science



STAGE 1

The impulse bands, *pure copper grade*, get wrapped tightly around the outside of a water pipe and the impulses generated from each band interact with each other causing an oscillating frequency-field. These colliding impulses radiate 9-16 feet on both ends of the impulse bands along the internal pipe, making up the water treatment zone. Over 40 years of field testing and improvements create a condition in which **Calcium Bicarbonate Ca(HCO3)2 is washed away with the water as smooth rod-shaped mono-crystals that do not bond to surfaces as Calcium Carbonate Crystals (CaCO3).**

STAGE 2

$Ca(HCO_3)_2$ Calcium Bicarbonate + Vulcan Descaler Impulse frequencies = $CaCO_3$ Calcium Carbonate + CO_2 Carbon Dioxide + H_2O Water

Creates an environment in which there is a Carbon Dioxide (CO2) surplus to dissolve mineral deposits.

H_2O Water + CO_2 Carbon Dioxide = H_2CO_3 Carbonic Acid

The natural H2CO3 surplus dissolves existing scale deposits faster than it can be created (*Natural Resolving Process*) and the mono-crystals do not bond to surfaces to create mineral deposits.

STAGE 3

Oxidation occurs on all metal pipes through contact with water minerals. These oxides seriously affect metal surfaces and contributes to corrosion. Our descaler technology helps to protect internal metal surfaces against rust damage and perforation through a process called Electrophoresis *(the migration and separation of charged ion particles).* **This Electrophoresis effect creates a protective metal-carbonate shield to protect metal surfaces from aggressive substances, which could lead to future corrosion.**

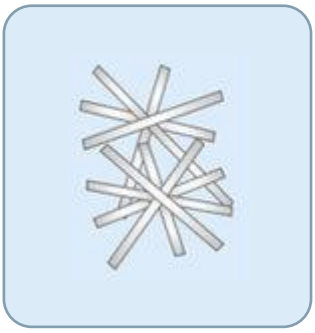
Installation does NOT require specialized tools or a high degree of skill

NYC URGENCY
2024 & 2030

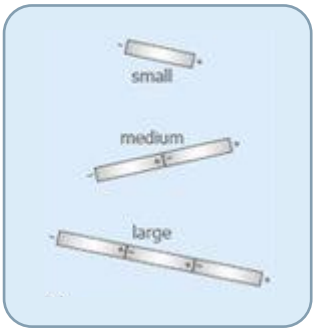
This **GREENTECH** can be used to help meet NYC 2024 immediate urgency to make buildings more energy efficient as you continue to maximize energy reductions into 2030 and beyond to 2050

Holistic building-wide implementation plans

12 models | up to 40 inch water pipe with unlimited water flow rate



Untreated Mineral Scale

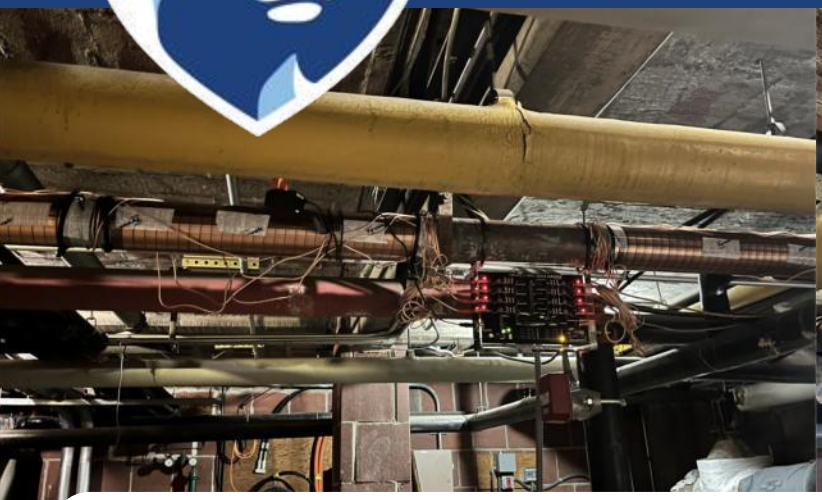


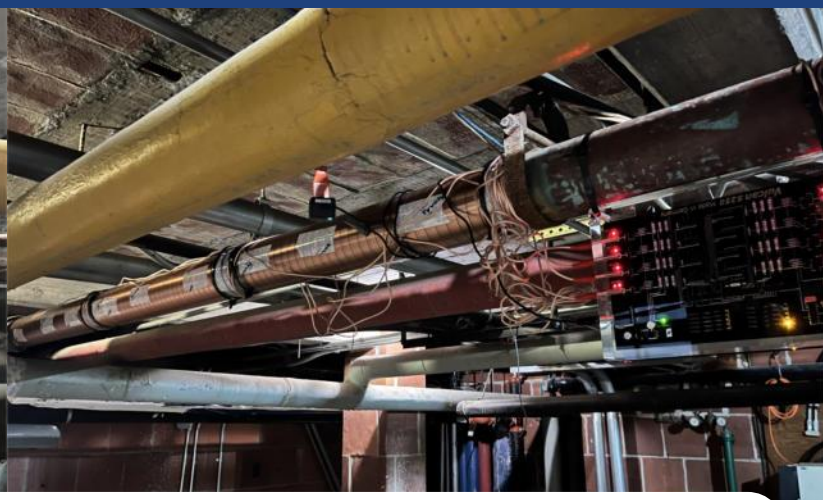
Treated Mono-Crystals

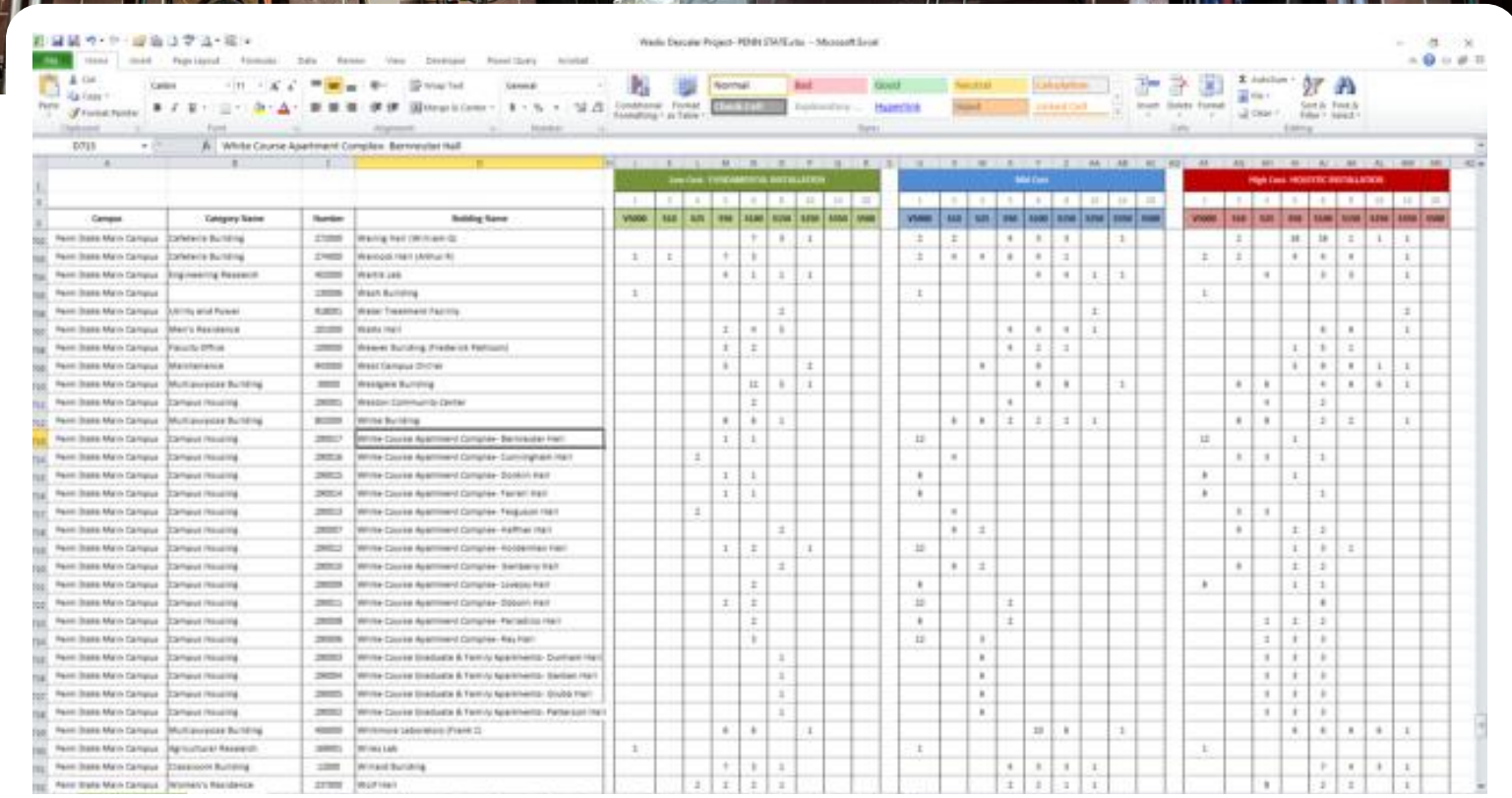
25 YEARS INTERNATIONAL WARRANTY

PennState Campus

student housing heat exchanger trial







Recently in 2024, we installed a mineral descaler system in a Penn State student housing buildings as a trial to prove the effectiveness of the technology. In addition to this, we submitted a theoretical cost estimate for each building on campus across 3 mindsets:

- Fundamental Installation
- Mid-Range Approach
- Holistic Building Installation

Case Study:

shopping mall 4 year field test

February 2014 - February 2018

First Inspection:
March 4, 2014

Heat Exchange Tubes were manually cleaned to remove virtually all of the extisting mineral scale buildup.

Last Inspection:
February 12, 2018

After 4 years the inside surfaces of the copper tubes showed NO additional scale formation

During the 4 years their system was NOT treated with chemicals and no system maintenance was required. Administration and maintenance staff reported the prevention of rust in their iron pipes.

Benefit Summary:

Large savings on chemicals: No descaling chemicals were used in the cooling towers

Rust prevention in their iron pipes

Eliminated scale in refrigeration compressors: no scale in the condensers- operated at peak efficiency

Huge savings on blow down water consumption: The condenser tubes were kept clean so no water was wasted- representing a saving of virtually all previously wasted water caused from blow downs.

Payroll Savings: no operational stoppages required for condenser cleaning, less testing and fewer inspections needed.

Supervision Savings: inspection frequency and laboratory water testing expenses reduced – engineers appreciate the “set and forget” of this automatic water treatment system.

Significant Findings:

No system maintenance was required.

Cooling Tower: water blow downs were vastly reduced and ALL AC compressors ran entirely at clean condenser efficiencies.

Chemical treated cooling tower (max EC limit: 1,200 µS/cm); the descaler treatment allowed for a much higher EC limit: 10,000 µS/cm

Up to 10,000 µS/cm Electric Conductivity levels could be safely ignored; including high TDS, metals, anions and many other substances

Condenser heat exchanger copper tubes: No scale formation was found

R22 refrigerant gauges on all condensers remained at constant hot gas head pressure.

Case Study:

7 weeks to totally transform mineral scale

Productivity increase - reduction of scale incrustations

Less time and effort spent on cleaning cooling towers

Spend less on machinery maintenance

More efficient use of energy costs

Fast amortization of acquisition costs

Reduces chemical use in many areas

Maximum working life of production equipment

More reliable water supply

Extended cleaning intervals

Case Study:

LEED Platinum Green Building Certification

Mineral Descalers are installed on the condenser main return pipes; supporting 7 cooling towers.

The Energy Complex was the first ofice building in Thailand and Southeast Asia to be awarded the LEED Platinum Green Building certification.

More than 1,300 Lbs of mineral scale was collected and removed from their cooling tower basins over a 4-month period. *(approximately 330 Lbs per month)*

Significant Findings:

Before the Energy Complex installed the Mineral Descalers, the building utilized ozone to treat the condenser; however, their ozone water system could not effectively treat and manage the increasing scaling concerns.

After only 4 months, the Energy Complex building observed a significant mineral scale reduction in the cooling tower basin.

The approach temperatures of the chillers were reduced, lowering and saving energy consumption while improving overall performance.

Case Study:

Manufacturing company with 7,000+ worldwide employees

several air conditioning related mineral scaling issues

Mineral Scaling Problems:

1. Air-conditioning systems had serious scaling problems
2. Heat exchange efficiency had been reduced.
3. Silica buildup on their cooling tower was difficult to remove and the maintenance cost were expensive
4. The inside pipelines were rusted and they could no longer use typical chemical treatments
5. The hot water flow in their dormitory was low, and the water was often yellow.

Case Study:

Oilfield Improves energy trasfer

before installation: every 3 months heating efficiency was reduced by 50+%

Geographic Area: water hardness 86 GPG / 1,470 ppm

Heat Exchanger efficiency continuously decreased due to mineral scale in the tubes.

More gas has to be used to heat the furnace, this dramatically increased their energy consumption.

Every 3 months their heating efficiency would drop below 50% and at the end of the year they had to manually clean all the pipelines.

This process was time consuming, costly, and reduced production capacity.

Water Hardness Scale

SOFT: Less than 1 GPG

SLIGHTLY HARD: 1 - 3.5 GPG

MODERATELY HARD: 3.5 - 7 GPG

HARD: 7 - 10 GPG

VERY HARD: 10+ GPG

AFTER 6 months:

NO additional electricity was used and more impressively, their overall heat exchanger efficiency was still at 80%

Case Study:

Chrysler Transmission Plant

saves $15,000 per machine/year

BEFORE

3 weeks of normal operating conditions

Screen and nozzle from the high pressure deburr machine. Maintenance would use acid cleaning to remove 12mm of calcium buildup in the nozzle

AFTER

3 weeks while using the descaler

The same screen and nozzle from the high pressure deburr machine after installing the mineral descaler 3 weeks.

Annual Cost Savings:

High pressure DeBurr/Washer: 100 gpm @ 1,000 psi water & soluble oil.
Annual Cost Savings = $15,000 per Machine/Year

WASLIX:
CLEARLY CLEAN WATER SOLUTIONS

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