# Providing Cooling Water Management System Solution through DeCalon™

## DeCalon™ (DCI)

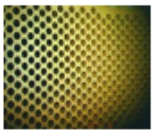
DeCalon™ (DCI) is a revolutionary approach to eliminating scale, preventing corrosion and bio-fouling in cooling water systems. Through applied electro-chemistry and a patented intelligent controller DCI removes water hardness from cooling systems without the need for hazardous chemicals. The innovation provides a green technology solution to scaling and corrosion in large building HVAC systems and industrial chiller circuits. The DCI system removes existing scale deposits and prevents further scale formation by driving a non-spontaneous redox reaction which precipitates $CaCO_3$ and $Mg(OH)_2$ at the cathode. The main causes of scaling, $Ca^{2+}$ and $Mg^{2+}$, can then be dumped off the recirculating cooling water. $SiO_2$ is also removed. The system operates continuously so design heat transfer efficiency is maintained at all times and the requirement for routine shut downs and chemical descaling is no longer required. Water blow-down quantities are also substantially reduced.

Conventional method uses eco unfriendly 100% chemical approach. But scale deposits still build up on heat exchanger tubes, pipes and cooling towers which will then require hazardous chemical cleaning and waste disposal. The blow-down containing chemicals from cooling tower pollutes the waterways. On the other hand, pseudo scientific Non Chemical Devices yield unsatisfactory results.

This compromised situation cannot be solved by continuing the same practice. This is why eco friendly **DeCalon (DCI)** System enhanced by **CataGreen (CG)** is now introduced to circumvent the problems of the above approaches.

Scaling, Bio-Fouling and Corrosion are very common in condenser of air conditioning system and industrial heat transfer process, but can be controlled and prevented by DCI System.

A badly scaled/fouled heat exchanger



A well maintained heat exchanger

## The Ultimate Solution to Scaling and Fouling Problem

DCI empowered by CG, removes scales by electrolysis according to:

- $Ca^{2+} + HCO_3^- + OH^- = CaCO_3 + H_2O$
- $Mg^{2+} + 2OH^- = Mg(OH)_2$

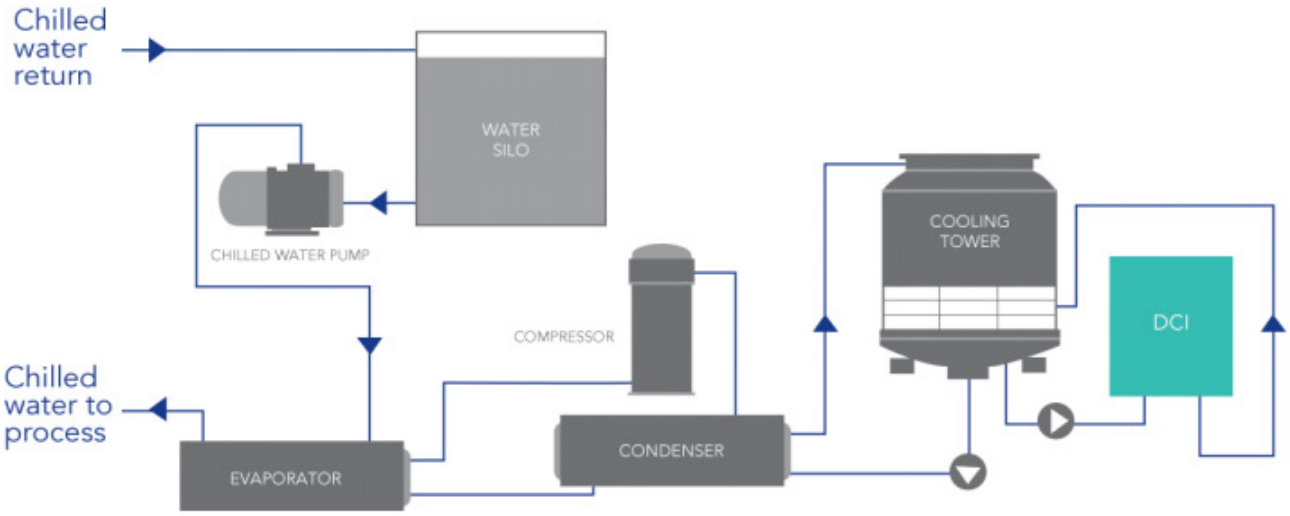
The main scaling culprits in water system i.e. $Mg^{2+}$ and $Ca^{2+}$ are dissolved from the pipes, heat exchanger and cooling tower, deposited on cathodes, dislodged and blown down automatically. Depending on water chemistry, disinfectant may also be produced. Anti-scalant, and corrosion inhibitor are no longer needed. In short, it is virtually **CHEMICAL FREE!** Also, hard, glass-like $SiO_2$ scale (picture on the right) can now be removed and prevented both by co-precipitation and adsorption by DCI.

## What does DCI do?

- DCI dissolves and removes existing hardness and silica scales and prevents further scale formation due to evaporation continuously.
- DCI/CG enhances the overall performance by preventing bio-fouling effectively.
- DCI removes Dissolved Oxygen and reduces ORP to reduce oxidation and corrosion.
- DCI creates an alkaline environment to prevent corrosion and also to increase Silica solubility.

## Industrial Chiller

Scale removal in industrial condensers and cooling towers reduces energy, water, maintenance and chemical costs.

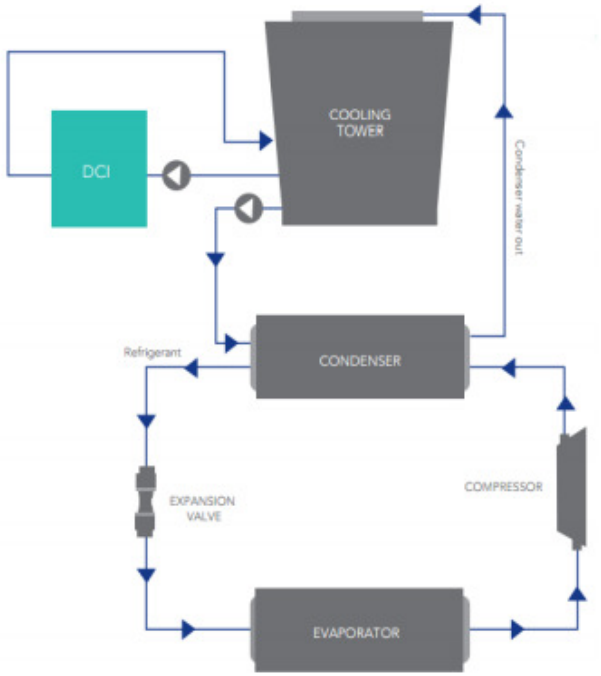


## Water Cooled HVAC Systems

A significant improvement in heat transfer and lower condenser approach temperatures leading to increased chiller efficiency.

### Easy to use Automation

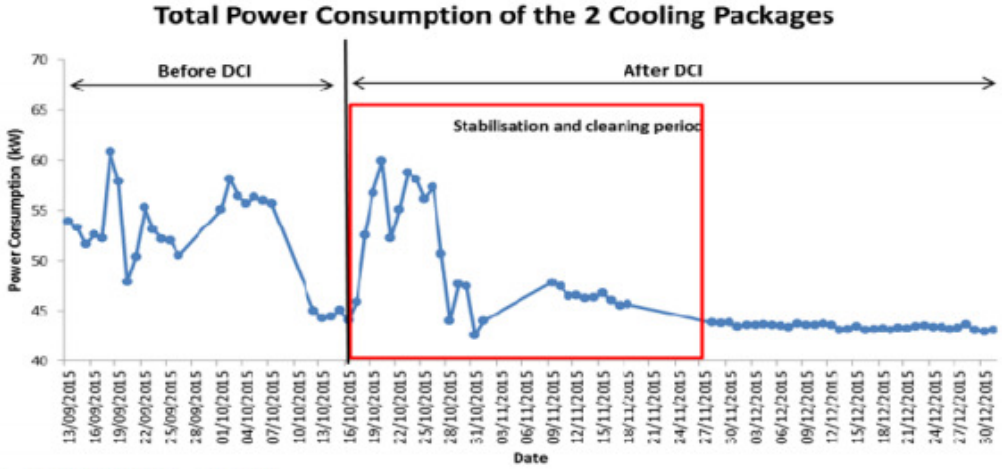
- The intelligent controller auto regenerates and maintains electrode performance
- Auto Scale Dislodge and Discharge
- Auto Conductivity Control
- Auto Amperage Control




## Performance Evaluation

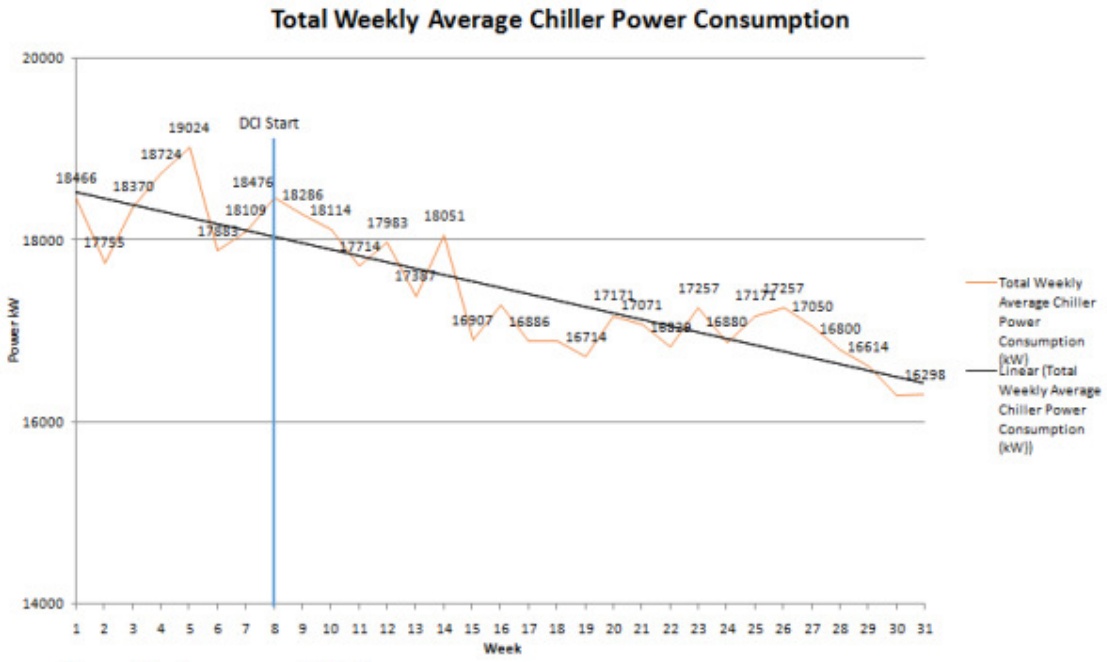
**SIMTech-A*STAR Singapore**

An independent party, SIMTech-A*STAR Singapore (Website: www.a-star.edu.sg) was engaged to evaluate the performance of DCI (Case Study Code: I15-E-125W). The followings were prepared and presented by them.



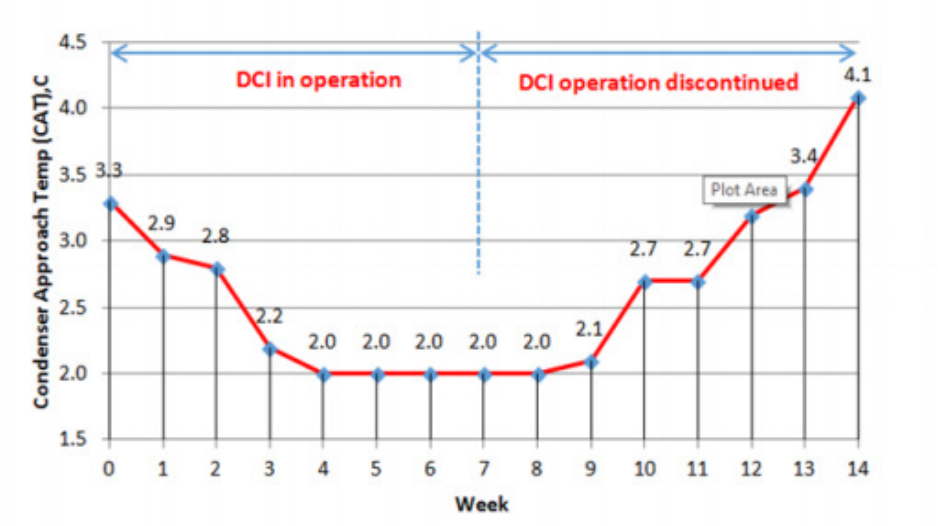

- **Power Saving - 17.5%**

## A Semi-conductor Company in Philippines



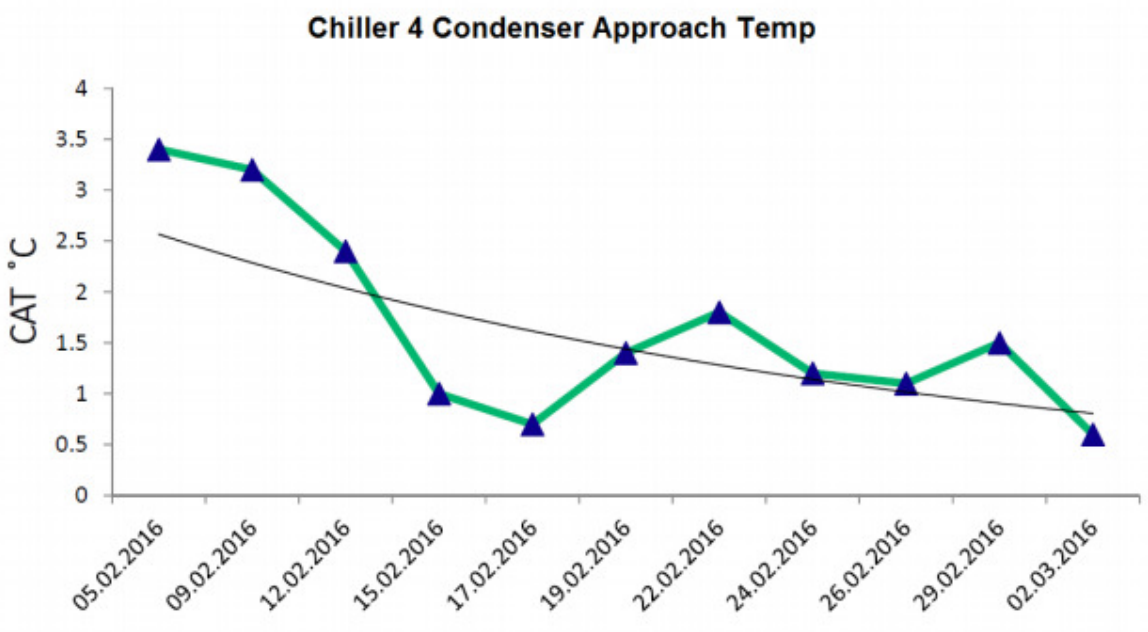

- Power Savings - 11.2%
- Water Savings - 27%
- Chemical Savings - 70%

## A Syrup Company in Malaysia




- Power saving - 16.9%
- Chemical saving - 57.7%
- Water saving - 88%

## A Hospital in New Zealand




- Power saving ~ 17%
- Chemical saving ~ 79%
- Water saving ~ 41%

## Benefits of DeCalon (DCI)


## General Specifications

| | |
|---|---|
| Dimension (mm) - overall | W=700 D =380 H=1200 |
| Weight | ~50kg |
| Max Power Consumption | ~600W |
| Max Operating Amp (DC) | 15 A auto adjustable |
| Max Flow | 2.25m³/h |
| Operating Pressure, Max | 1 bar |
| Input Power Source | Single Phase AC 110/240V, 50/60Hz |

*Specifications subject to change without notice.*

Certificate No. 9565
ISO 9001:2008

SINGAPORE GREEN BUILDING PRODUCT SGBC VERY GOOD
SGBP 2016-478

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