DeCaIon™

DeCaIon is patented in Singapore and abroad. It has been accredited with the current highest available rating as a green building product by Singapore Green Building Council (SGBC) since 2014 (Certificate: SGBP 2016-478).

Innovative Polymers is engaged in SGBC's workgroup committee to establish the cooling tower water treatment criteria. When launched, our present "Very Good" status shall be further upgraded to "Excellent" or beyond.

The Eco Sustainable Approach to Cooling Water Management

- **Cost Effective-short ROI**
- **Low Operating and Maintenance Costs**
- **Saves Money and Protects Environment**
- **Chemical Free**

Scaling/Fouling will increase the operation costs due to:

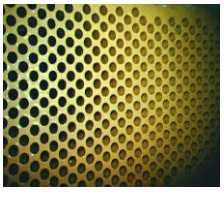
- Pressure increase, Flow decrease
- Poor heat transfer
- Loss of throughput
- Premature equipment and pipe replacement
- Maintenance shutdown
- The use and disposal of costly and toxic chemicals

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 **DeCaIon (DCI) System** enhanced by **CataGreen** 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

SINGAPORE GREEN BUILDING PRODUCT SGBC VERY GOOD

SGBP 2016-478

The Ultimate Solution to Scaling and Fouling Problem

Decalon empowered by CataGreen, removes scales by electrolysis according to:

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

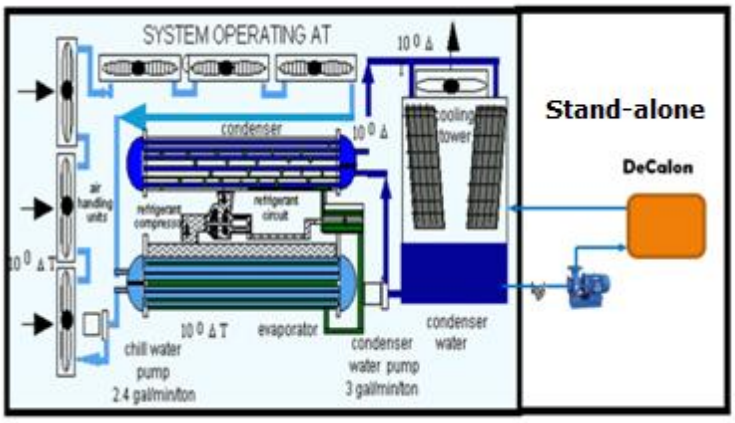
The main scaling culprits in water system i.e. Mg^{2+} and Ca^{2+} are dissolved from the pipes, heat exchanger and cooling tower, deposited on cathodes, dislodged and blown down automatically. Disinfectant is also produced. Anti-Scalant, biocide and corrosion inhibitor are no longer needed. In short, it is **CHEMICAL FREE**!

Also, hard, glass-like SiO_2 scale (picture on the left) can be removed and prevented both by cathodic reaction and adsorption by DCI. No hazardous NaOH, acid and etc are required!

How does DCI work?

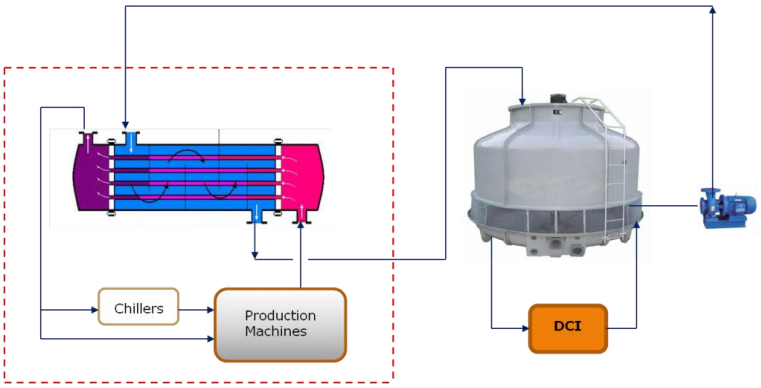
- Hardness and Silica increase due to evaporation is removed continuously
- Existing Hardness and silica scales are dissolved & deposited
- Scales automatically dislodged and discharged
- Auto mechanism regenerates and maintains the system's performance.
- CataGreen enhances the overall performance by preventing both Scaling and Fouling effectively

Scale Removal for Chiller Plant in Commercial Building



DeCalon improves heat transfer substantially and hence increases chiller efficiency resulting in lower Condenser Approach Temperature

Scale Removal for Industrial Applications



DeCalon improves heat transfer efficiency considerably in Cooling System for Production Machines, Air Compressor and etc

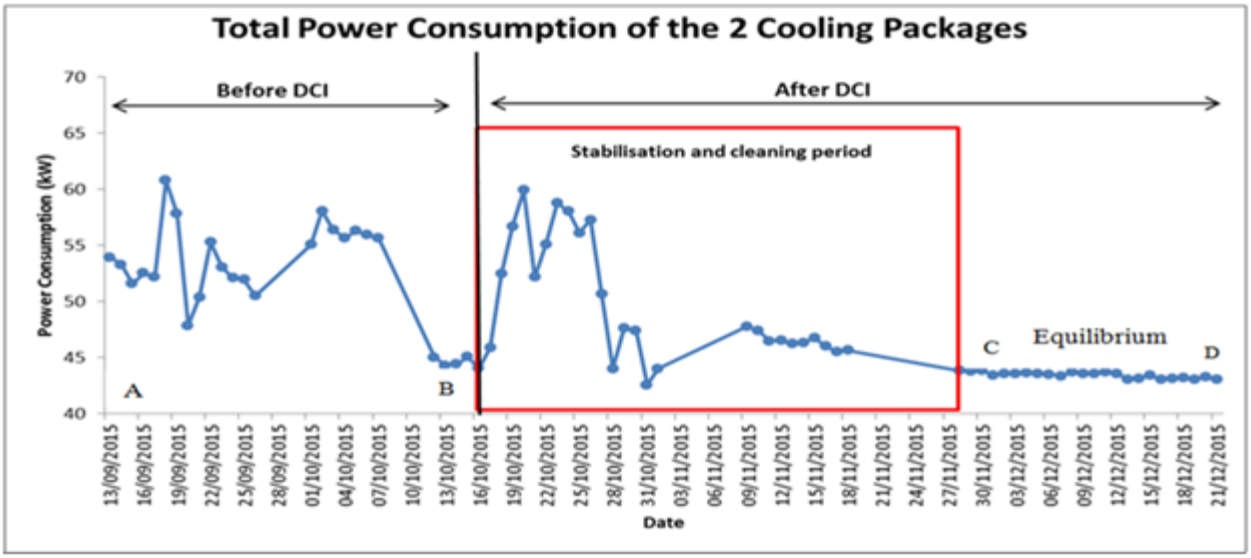
Design Features of DeCalon

- Auto Electrodes Regeneration
- Auto Scale Dislodge and Discharge
- Auto Conductivity Control
- Auto Amperage Control
- Auto Bio activities control

Performance Evaluation

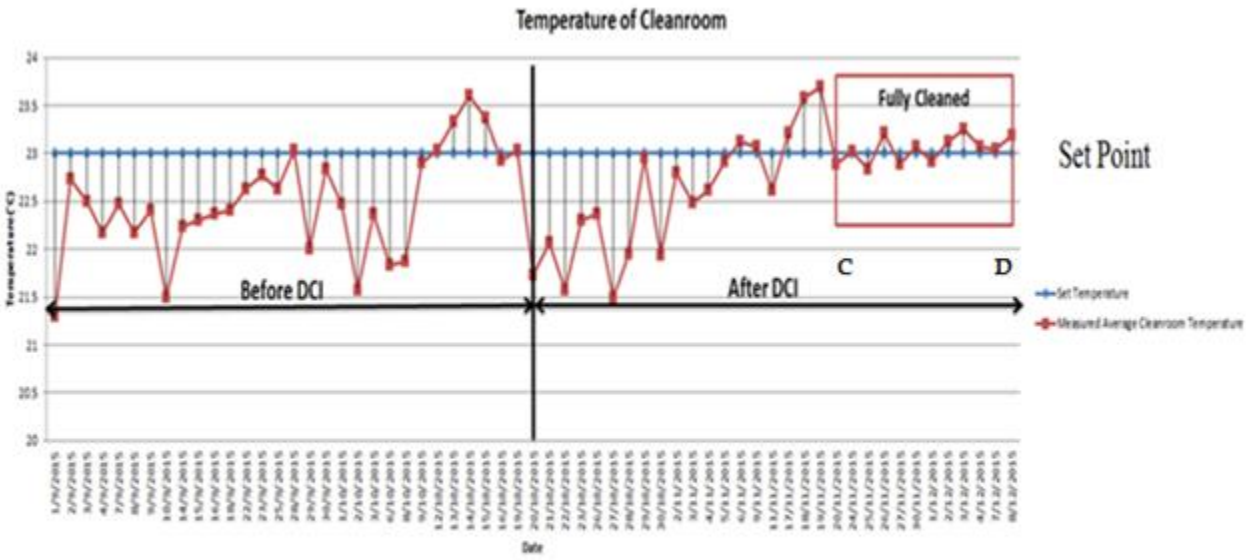
(A) SIMTech-A*Star

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.



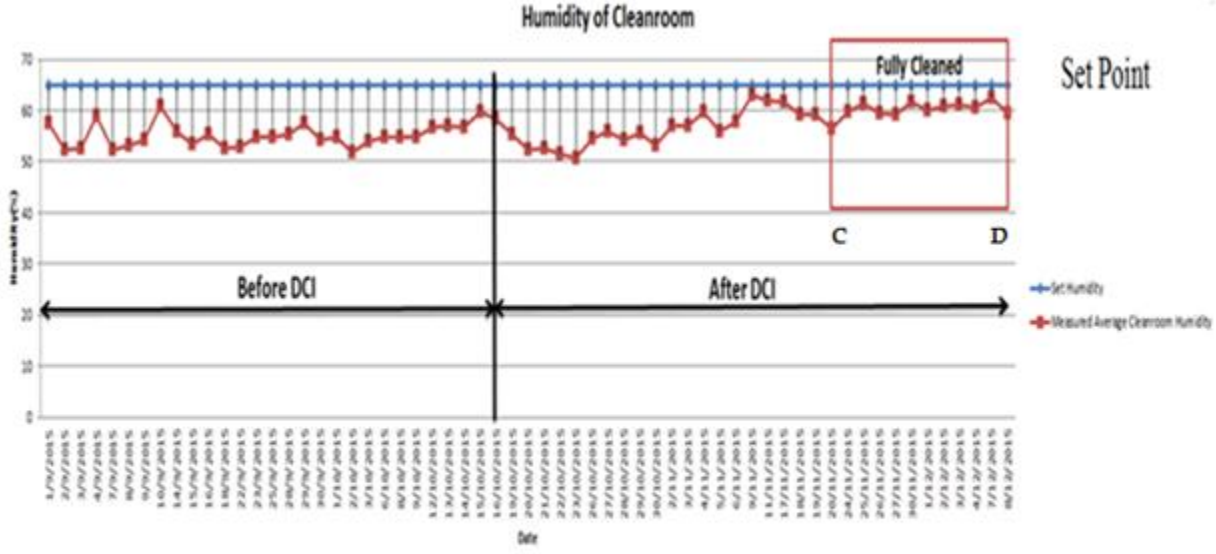
Av Power before DCI = 52.6 kW
Av Power aft DCI @ eqm = 43.4 kW

Percent Saving = 17.4%



The Clean Room temp is much more steadier and closer to the set point (23 ^{0}C) at equilibrium after the cooling tower/water system is fully cleaned.

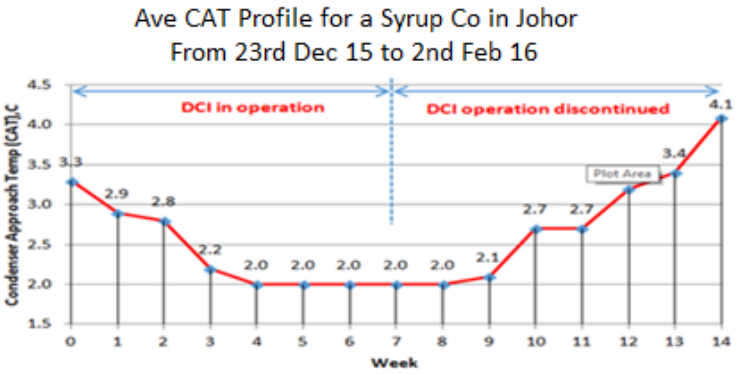
Average temp difference from set point = 0.04 ^{0}C



The RH is much more steadier and closer to the set point (65%)) at equilibrium after the cooling tower/water system is fully cleaned.

Average RH difference from set point = 4.84%

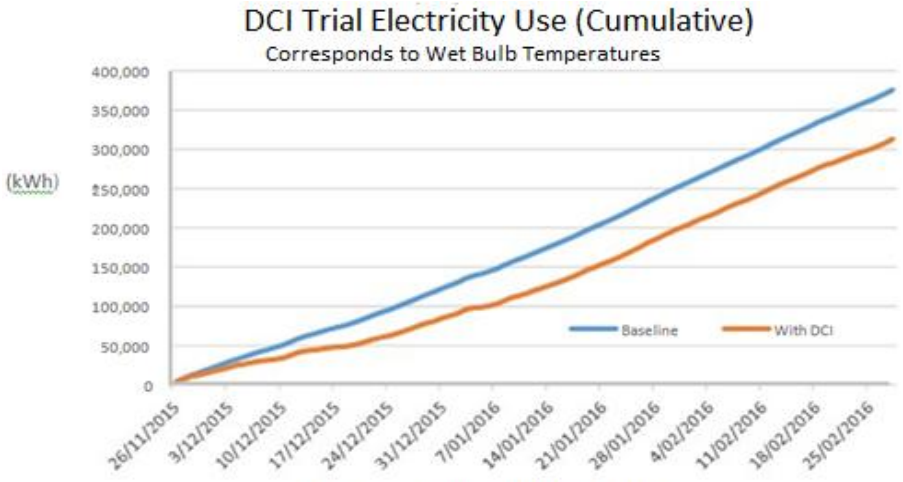
(B) Syrup Company in Johor



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

(C) Lake District Health Board – New Zealand.

Existing Scales dislodged from Cooling H_2O System during DCI operation



Energy saving by DCI ~ 17%

Benefits of DeCaIon

> 50% Water and Chemical Savings

~7-20% Power Savings

Higher Product Yield resulted from efficient cooling

Consistent High Product Quality due to efficient cooling

Chiller Compressor Maintenance/Replacement and Shut-down frequency reduced

Stand-alone Installation

Very little After-Sales Service

Good Return of Investment

Chemical Free: Blow-down does not pollute the waterways

General Specifications

DCI	15A	90A
Dimension (~mm)-overall	L = 700 B = 380 H = 1200	L = 1800 B = 800 H = 1800
Weight	~50 Kg	~150 Kg
Max Power Consumption	~600 W	~3600 W
Max Operating Amp (DC)	15 A auto adjustable	60- 90 A auto adjustable
Max Flow	~2.25 m^3/h	~12 m^3/h
Operating Pressure	1 bar, max	1 bar, max
Input Power Source	Single Phase AC 120-240V, 50/60Hz	Three Phase AC 306-415V, 50/60Hz

Specifications subject to change without notice

For more information, please contact:

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