



# Cleaning Chiller and Evaporator with Greenex R&S F1



Oct 2014

# Greenex R&S F1

- High performance to take out scale from tube
- Made from Herb
- RoSH approve
- Biodegradable



- No Corrosive on copper, steel and seal.
- Safe for operators
- Safe for Copper and Steel Tube
- Longer Life of chiller
- Environmental Friendly
- Save Operation Cost

# Equipment



Tube Cleaner Machine



Brush



Pump



Circulate Tank



Greenex R&SF1

## Step to Clean or Flushing



1. Check water valve, can be complete block.

2. Connect the circulate pipe to inlet water and outlet water back to circulate tank.



3. Fill water to Circulate tank about 100 liters first and fill Greenex R&S F1 5-30% up to time to circulate and fill in more water enough for circulate system



**Greenex R&S F1 1 pail for 100-150 tons**

4. Circulate about 3-4 hours or  
Conductivity stable.

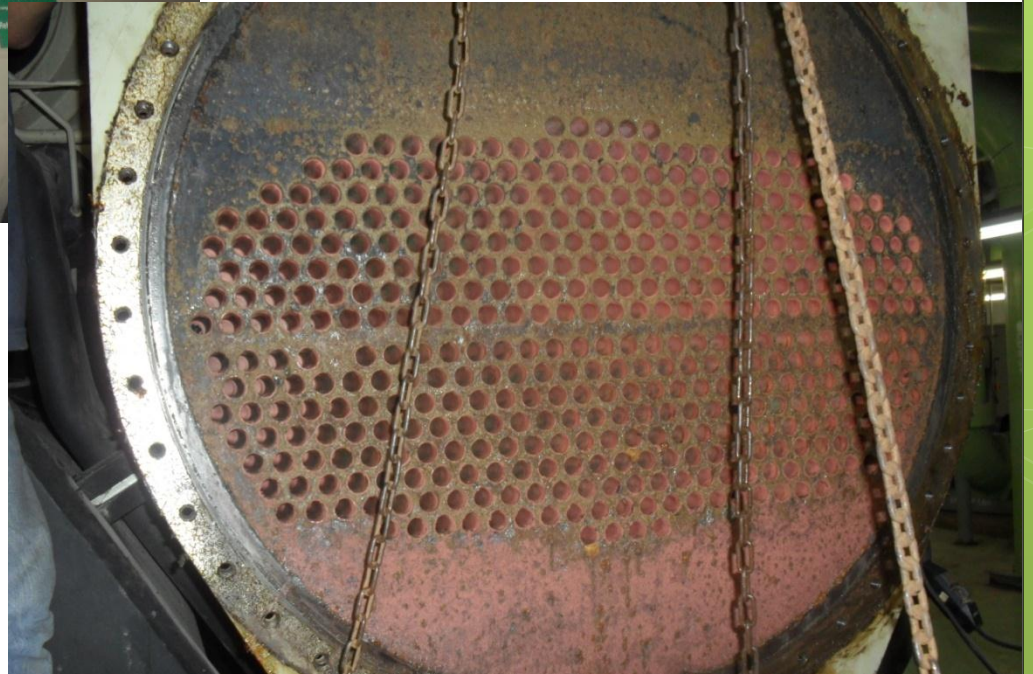


5. After circulate 4 hours, drain the water from condenser or evaporator and rinse with tap water again to system.





## 6. Open the cover Condenser or Evaporator



## 7. Clean the tube by Tube Cleaner



8. After clean every tube, Rinse with tap water



9. Close the cover and fill water to system of Condenser or Evaporator and open the inlet water valve and outlet water valve



## 10. Clean the floor and working area.



# Recommendation

## 1. Greenex CSD

dosage 500 ppm/m<sup>3</sup>/week

for apply in Cooling Tower is “ONLINE” cleaning and “Protection Scale Return”

## 2. Greenex CSD-CL

dosage 500ppm/cu.m/3 months

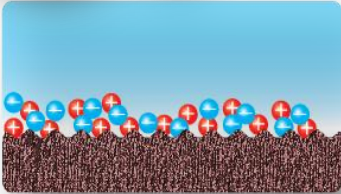
For “Protection Tube Surface” from scale in close system

**Longer Life Chiller  
and Cooling System**

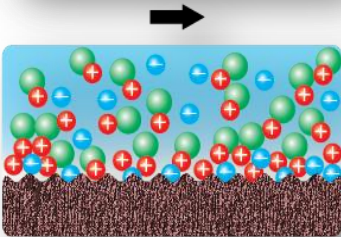


## PRINCIPLES OF SCALE FORMATION & SOLVING WITH GREENEX™ CSD

Scale is a natural phenomenon caused by the crystallization of ionized mineral dissolved in water, which may be classified into 2 groups according to their polar nature:



Cation particles which are positively charged including:  
Calcium ( $\text{Ca}^{2+}$ )  
Magnesium ( $\text{Mg}^{2+}$ )



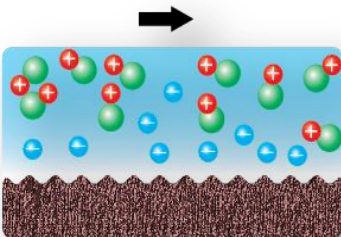
Anion particles which are negatively charged including:  
Chloride ( $\text{Cl}^-$ )  
Sulfate ( $\text{SO}_4^{2-}$ )  
Carbonate ( $\text{CO}_3^{2-}$ )  
Bicarbonate ( $\text{HCO}_3^-$ )



These dissolved mineral particles as they contain different charges, have a tendency to attract each other, for example:

- Calcium/Magnesium Carbonate
- Calcium/Magnesium Bicarbonate
- Calcium/ Magnesium Sulfate
- Calcium/ Magnesium Chloride

These dissolved minerals are a major and difficult problem in cooling systems. They may form hard scale on the walls within the system, especially where temperature changes may occur, such as the heat exchanging units.



### Solving Scale Problem with Greenex™ CSD

The principles in solving the problem of scale formation by using Greenex products are based on controlling the scale formation by keeping the dissolved mineral suspended in solution. By binding with the cation particles, the 2 ionic particles are kept in separation and dissolved. As the result, scaling will less likely occur. Also the products have the ability to dissolve old scale by utilizing organic acids, scale that had already formed within the system will soften and may be cleaned or flushed off easily.



# Customer

- Tesco Lotus Ratchaburi (Trane)
- THASCO Chemical (York, Carrier)
- CAT (Trane)
- RAMA II Hospital (Carrier)
- Muangsamut Hospital (Trane)
- Hillton Malaysia (Greenex CSD)
- Toyota Malaysia (Greenex CSD)
- Valeo (Greenex R&S F1)
- Denso (Greenex R&S F1 and CSD)



# Survey Form

1. Gap of Temp (In-Out)?
2. Quantity of Water in System (Liters)?
3. Power Consumption per month?
4. What chemical for flushing?
5. Water quality (sample)?
6. Problem? (corrosion, scale, gap temp, leak, etc)