



Cleaning of Plate Heat Exchanger of Central Heating System

Scaling Problems of Plate Heat Exchanger

- Circulating water forms scale when heated (Scale thickness increase 1 mm, heat transfer efficiency decreases 8%-9% or even more)
- Outside impurities make pipe network blocked
- Rust from inner surface of the pipe forms rust mud

These problems have greatly reduced the efficiency of the heat exchanger, also have damaged the heating system caused by scaling and corrosion.

- Energy consumption increases, and operating cost goes up

After scale and biological slime form in the heating system, the heat transfer efficiency of the heat exchanger declines, the flow area of the circulating water decreases, and the flow resistance increases. As a result, energy consumption in the whole operation process increases dramatically, and so does the heating cost.

- Work efficiency declines, and heating result affects

The scale in the heating system makes heat exchanger inefficient, resulting the media temperature difference between the inlet and outlet shrink, and then lowers the heating efficiency.

Heat loss caused by scale (CaCO ₂ mainly)						
Scale Thickness (mm)	0.5	0.8	1.0	1.25	1.6	2.2
Heat Loss (%)	3.5	7.0	8.0	10.0	12.5	15.0

- Shorten the Service Life of the Equipment

Scale and slime would seriously affect the normal operation of the system. Due to the corrosion problem, the metal materials in the heating water system would be damaged, and this damage would definitely shorten the heat exchanger's service life.

The purpose of using the 1st TECH Biodegradable Descaler:

- Clear away all the scale, slime, and corrosion products in the circulating water system. Ensure the system operate safely, normally, and with a high efficiency
- Reduce operation cost, save energy, save power consumption or heat consumption by 20%~30%
- Protect heat exchanger plate, and prolong service life

Case One: On-line Cleaning

Application: Plate Heat Exchanger

Material of the Application: 304 Stainless Steel

Size of the Application: Heat Exchanger Area is 1076.39 Square feet

Problems: Low efficiency due to the scaling problem

Solution: 39.6 Gallon of 1st TECH Biodegradable Descaler, adding 2 to 3 times water, washed 6 hours with self circulating cleaning system.



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Outcome: Water scale, rust scale, and slime have been cleaned away. Equipment operated normally. Greatly increased equipment's efficiency, and reduced the energy cost.

Case Two: Transformer rectifier cabinet pure water cooling device plate heat exchanger cleaning

Application: Cooling device (model number: LSS-300B)

Application Details: Heat Exchanger Area is 3229.17 Square feet in total (Two heat exchangers, 1614.585 Square feet for each). Plate size is 31.50 x 15.75 inches. Every heat exchanger has 50 plus plates.

Operating Conditions: Pure water and industrial circulation water as the cooling media. Temperature difference between major-minor media is 41 °F. The flow rate is 52 T/H. Normal operating temperature is 86 °F.

Problem: Alarm will sound when the equipment temperature goes up to 122 °F. The equipment was operation at a temperature between 114.8 °F to 118.4 °F before cleaning. Hydrochloric acid with a concentration of 30% has been used to clean it. The cleaning process produces a lot of bubbles, and it stops cleaning when bubbles reduce. This kind of cleaning brings serious corrosion problem to the equipment. The company stopped using this cleaning way after several times.

Solution: The company switch to use 1st TECH Biodegradable Descaler to circulating clean five sets of the cooling devices, and immersing clean ten plate heat exchangers.



Outcome: The temperature of the equipment decreased dramatically, which ensure the equipment operate safely and efficiently. Most of all, there was no corrosion effect.



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Compared to the current chemical pickling method, the benefits of using 1st TECH Biodegradable Descaler:

- Safe and environmentally friendly
1st TECH is non-toxic, non-hazardous, non-corrosive and biodegradable.
- Fast and efficient
1st TECH contains special wetting and penetrating agents which can actually dissolve the deposits and can directly wash to the original metal surface of the equipments. Meanwhile, the organics in the product can form a pre-film on the metal surface, this film can protect the metal from corrosion. Normally, the cleaning applications can be accomplished in two to four hours, no more than 12 hours for large systems.
- Low costs
For usual scales, 4 pound basic solution of 1st TECH can dissolve 1 pound pure carbonates scales. It can ensure the production time and has non-corrosion to equipments; also it is energy saving; if take these into account, the costs is very low and even can be ignored.
- Easy to use
1st TECH can be used via online circulating, immersing, spraying and other methods to clean the scales. Because it has no corrosive effect to human body and equipments, enterprises can clean their equipments with it all by themselves.
- Biodegradable
1st TECH is tested and proved to be biodegradable, so its discharge is not a problem.