



We submit this brandname for 3.10 Auto Tube Condenser Cleaning System (Automatic Tube Cleaning system)

The HydroBall System

Non-Powered™
Globally patented
Automatic Tube Cleaning System

THE PROBLEM FOR SHELL & TUBE HEAT EXCHANGERS

Increasing electricity consumption with Fouling Buildup

During Aeration in the cooling tower, cooling water picks up airborne particles such as dust, soot and microbes. The high temperature heat transfer process transform the airborne particles and soluble sales into scales which clog up the condenser inner tubes, raising energy cost and degrading performance of the entire system.

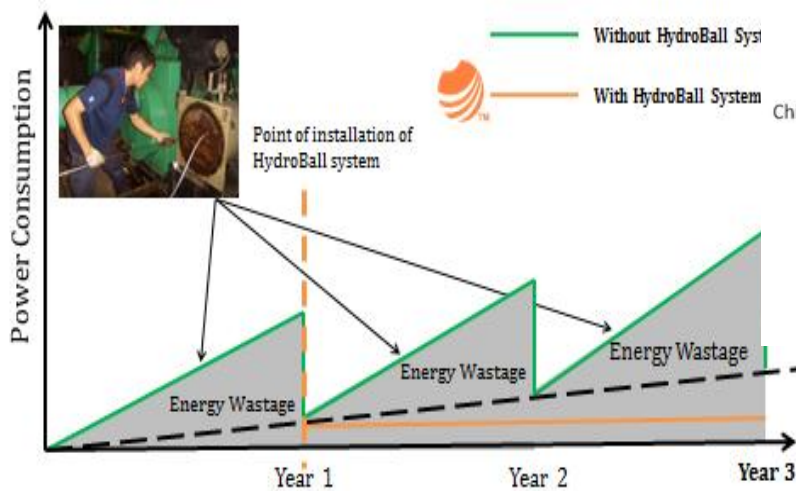
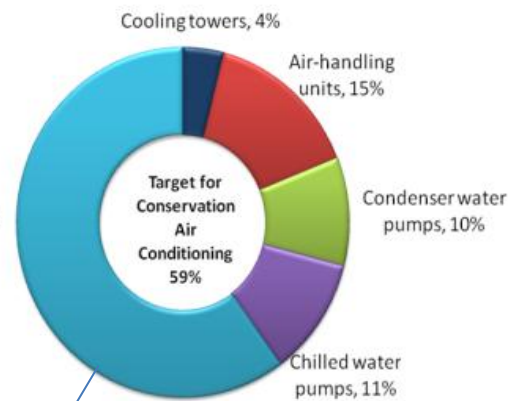
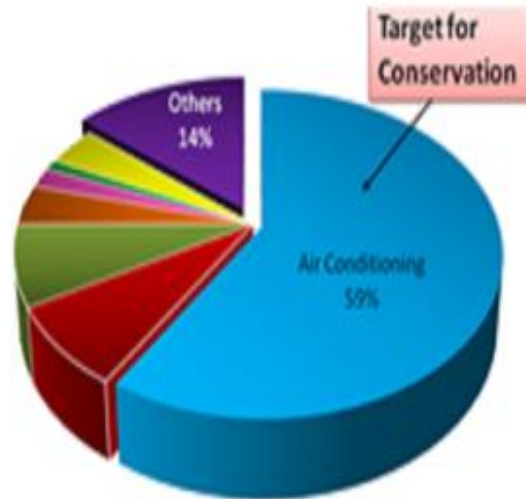
Scaling and fouling begins to take place after 200 – 400 hours from last manual cleaning of condenser tubes, hence the ideal practice is to manually clean the heat exchanger tubes once every 200 hours.

This is extremely expensive and unproductive! Traditionally cleaning methods such as manual cleaning, is a short term solution and in addition, poses several challenges:

- Requires chiller shutdown
- Labour-intensive, low productivity
- Oversized brush damages tubes
- Undersized brush not effective in removing fouling
- Need to ensure tubes are cleaned thoroughly
- Accessibility (need of scaffoldings) & Security issues

Chillers use at least 35% of energy consumption

Fouling can be very costly since it directly results in increased electricity consumption, interrupted operation, and increased maintenance costs. Maintenance costs can also be expected to continually rise because of environmental regulations. In Singapore, cleaning costs are between the range of S\$1,000 to \$5,000 per heat exchanger per clean.



Biggest Potential for energy conservation

Hydroball System is the perfect cost-effective solution that eliminates equipment downtime and optimizes energy utilization of water-cooled heat exchangers (including chillers) by automatically keeping heat exchanger tubes perpetually free from effects of scaling and particulate fouling. This ensures optimal heat exchange efficiency, contributing to prevention of unnecessary energy loss and low total-cost-of-use.

BENEFITS OF AUTOMATIC TUBE CLEANING SYSTEM

BENEFITS OF THE HYDROBALL SYSTEM

Totally **Non-powered**™

The system relies on the force of the cooling water passing through the heat exchanger and its water supply and water return pipes. It does not require a power source (like pumps and compressors or bulky 4-way converters) to keep the cleaning system in motion. The cleaning balls are circulated through the condenser by kinetic energy in the water caused by pressure difference across the condenser and different sections of the water pipes. Being non-powered also results in less system moving parts and hence less maintenance.

1) **No Mixing of Hot and Cold Water within Condenser**

If heated water leaving the condenser mixes with water re-entering the CWS (a design limitation in some automatic tube cleaning systems), it will result in loss of chiller efficiency and additional energy needed to effect heat transfer. Hydroball system is designed with a unique “Double-loop” to prevent mixing of hot and cold water.

2) **No Loss of Water**

Some automatic tube cleaning systems discharge up to 30 to 40 liters of chemically treated water into the drainage system as part of normal operations. Not only does this waste water, it also poses a discharge hazard. Hydroball System does not discharge water at all during normal operations.

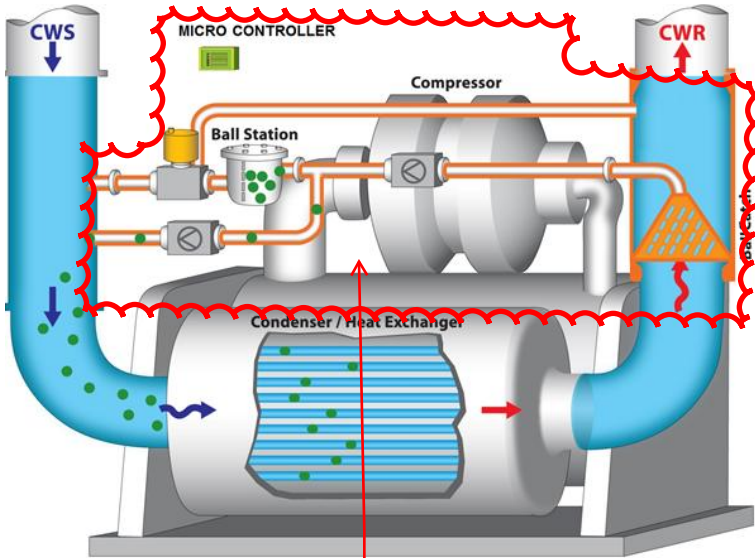
3) **Totally Effective Against Particulate Fouling**

While most automatic tube cleaning systems focuses on removal of crystallization fouling (i.e Scaling), the effect of particulate fouling should also be a prime concern, especially in urbanized cities throughout Asia where airborne particles enter into the condenser tubes via the cooling tower. The impact of particulate fouling (on condenser tube fouling factor and hence heat-exchange efficiency) can be felt within hours of ingress, unlike scaling which takes a few hundred hours to form; hence short cleaning intervals are needed. Hydroball System’s specially formulated sponge balls are frequent cleaning cycles (of 30 mins interval) are the most effective remedy against particulate fouling. Note: Anti-scaling solutions like magnetic devices, chemical treatment or ultrasonic devices etc are totally ineffective against particulate fouling.

4) **GUARANTEED PERFORMANCE**

Even with the above factors in place, there is still NO guarantee that the installed automatic tube cleaning system will work well as claimed by the manufacturers. Users often experience instances of missing and broken balls, either jammed or stuck. ONLY HYDROBALL TECHNICS provides a multi-year Hydroball Preventive Maintenance Programme where we guarantee NO missing balls and NO uptrend in CAT readings during the entire period the Hydroball system is in operation, amongst many other benefits.





HOW DOES IT WORK?

Three primary components: the BallStation, BallCatch and the Micro-Controller. A single 3-way motorized valve controls the flow of water within the system. There is no use of pumps, compressors or diverters nor any need for discharge of water during operation. The Hydroball System circulates the sponge balls through the condenser tubes at programmed intervals without causing any disturbance to the cooling water pressure. There is also a viewing glass at both the Ball Station and the BallCatch to enable visual monitoring of the sponge balls. Hydroball Technic's innovative design and comprehensive maintenance programme guarantees ZERO occurrence of missing sponge balls during use and NO uptrend in Condenser Approach Temperature (CAT)

Hydroball (Automatic Tube Cleaning System) all the Orange Colour part. Detail sparepart please see Hydroball Operational Manual.

CASE STUDIES : NTU Singapore

Condenser Tubes With Auto Cleaning System

NTU Chiller 2 at N2B5C2 inner tube inspection
WITHOUT Autotube Cleaning System

Condenser Tubes Without Auto Cleaning System

NTU Chiller 3 at N2B5C2 inner tube inspection
WITH Hydroball System

A COMPREHENSIVE MAINTENANCE PROGRAMME



Hydroball Technics (SEA) Pte Ltd offers a comprehensive maintenance programme to ensure that the Hydroball system is always running at optimum performance levels. Our comprehensive maintenance programme includes quarterly checking for leakages and changing of sponge balls to ensure optimal efficiency in the cleaning of condenser tubing and chiller performance.



Chiller at URA Centre (Urban Redevelopment Authority)



Chiller at MDIS Singapore

Hydroball Technics, established in 2003, is the principal manufacturer of the award-winning automated tube cleaning Hydroball System with 42 patents in 21 Countries. We are a key player in a fast-growing energy-efficiency products and services industry with distributors and customers both locally and internationally. HYDROBALL SYSTEM has been has received the Innovator Award in 2004 from THE ENTERPRISE CHALLENGE (TEC) under the Prime Minister's Office Hydroball Technics (SEA) Pte Ltd is engaged in the generation of intellectual property related to efficient industrial water cooling and energy conservation in chillers and large process plants using water-cooled shell-and-tube heat exchangers. The Company aims to deliver practical resource conservation solutions with short payback period while possessing significant impact on energy costs, safety and productivity

OUR CLIENTELE



Member of



HYDROBALL TECHNICS (SEA) PTE LTD
 Joo Chiat Complex, Blk 1 Joo Chiat Road,
 Singapore 420001
 Tel: +65 62603880
 Email : alice@hbt.com.sg
www.hbt.com.sg

