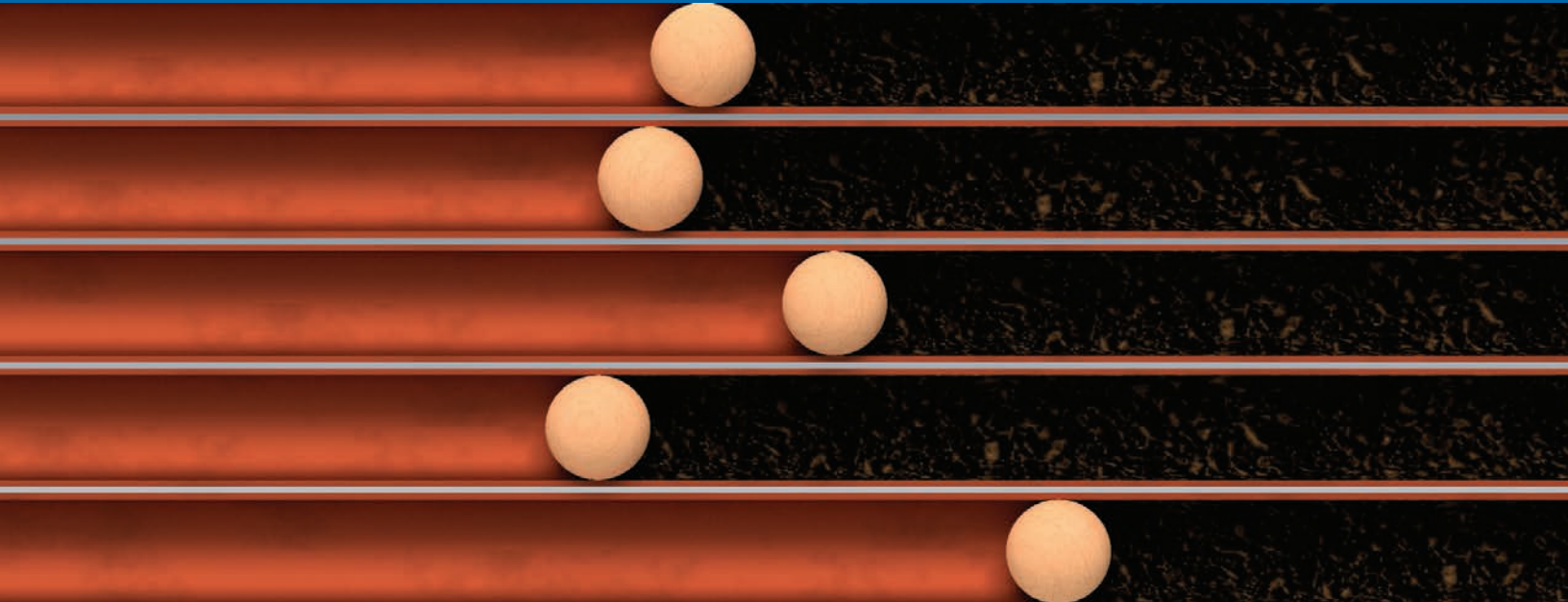


# WTR<sup>®</sup> Condenser Tube Cleaning System

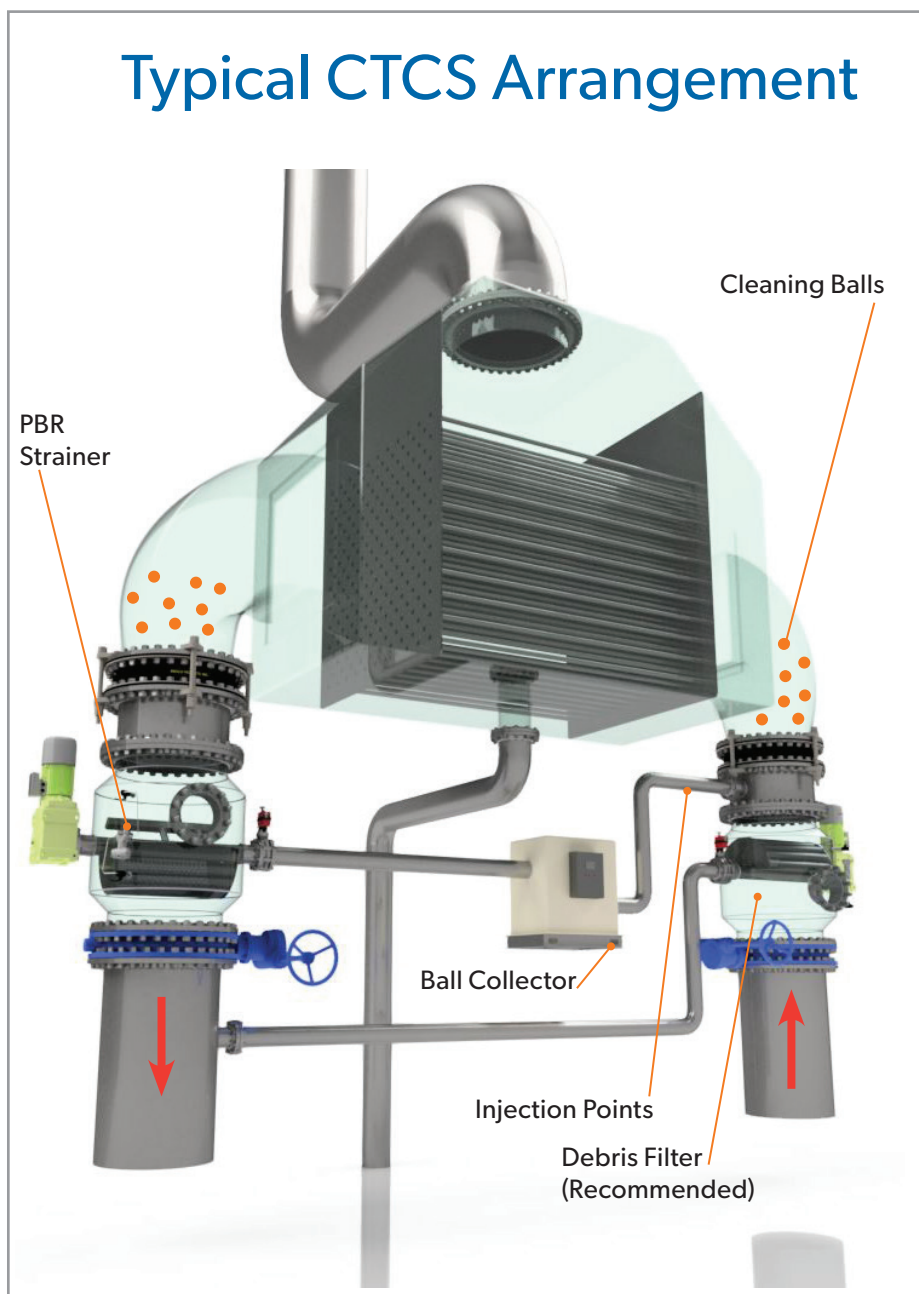
Condenser and Heat Exchanger Protection



# WTR Condenser Tube Cleaning System

The WTR Condenser Tube Cleaning System (CTCS) is vital for the prevention of micro-fouling from contaminants in cooling water circuits. CTCS's are used where impurities within the cooling water form scale deposits on inner tube surfaces during the heat transfer process, reducing the heat transfer rate, often requiring a de-rating of the plant output. Applications include power plants (fossil & nuclear), refineries, SAG-D, chemical plants, industrial plants, mills and numerous other types of plants with shell & tube condensers or heat exchangers.

Micro-fouling (scaling or precipitation fouling) of condenser and heat exchanger tubes is common due to foulants in the water such as calcium carbonate, calcium sulfate, salts, lime, etc. Scale accumulation creates an insulation, thus greatly diminishing the heat exchange process. This can lead to an increase in turbine back pressure or create other detrimental effects, depending on the condenser/heat exchanger service. Unchecked, this typically results in shut downs requiring manual cleaning in a confined space. Manual tube cleaning can be time consuming and commonly uses harsh brushes, chemicals or other costly and laborious cleaning methods.



The WTR Condenser Tube Cleaning System is designed to maintain a condenser's peak cleanliness factor. Elastomeric (cleaning) balls, slightly larger than the tube ID, are injected on the inlet side of the condenser/exchanger. Cleaning balls are introduced in such a manner to promote random distribution. The velocity within the circuit will compress the balls as they enter a tube. The system velocity propels the balls through the tubes, thus wiping the ID to prevent build-up of impurities, silt or filting. Upon discharge, the cleaning balls are positively captured and retained in the condenser discharge line via a custom ball strainer. The cleaning balls are pumped to a collector for either collection or recirculation.

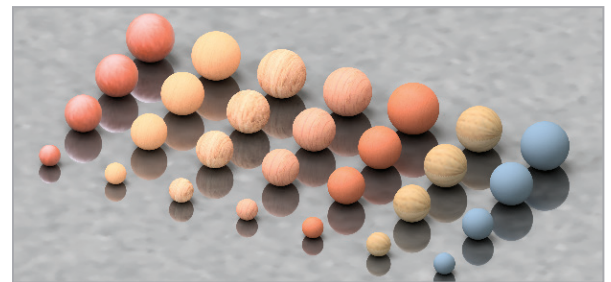
The ball strainer is housed in a shell, flanged to mate with the cooling water discharge lines. Custom lengths, flanges and arrangements are common. The CTCS utilizes an HMI touch screen control interface, allowing for easy monitoring. Individual or multiple systems may be controlled from a common panel. Other options such as plant DCS control is available. Controls and Drives can be supplied for hazardous locations.

# Features:

- Continuous, Online, Automatic tube cleaning without interruption to cooling or process water flows.
- Pipe Connection sizes: 24" to 120" (600mm to 3,000mm).
- Flow Rates: 10 to 250 K GPM (0.63 to 15.7 m<sup>3</sup>/sec) depending on aperture.
- Cleaning Balls of various sizes, hardnesses and surface textures to combat varying contaminants.
- Injection pipes and locations designed to stimulate random distribution through the condenser.
- PBR Strainer provides Positive Ball Retention to prevent balls from escaping the system for zero or no ball loss.
- Heavy wall carbon steel Ball Strainer shell, internally rubber lined or epoxy coated. Exterior coating as required.
- Ball Strainer internals of 316L SS, Duplex 2205 or Super Duplex 2507. Other specialized materials available.
- Strainer shell of standard or customized length for new plant or retrofit into existing plant piping scheme.
- Ball Strainer Rotor Drive is an industrially rated heavy duty gear unit with reversing capabilities for continuous duty.
- Strainer access manway for removal of unforeseen or oversized debris entering the system.
- Circulating Pump is non-contacting of high efficiency to reduce power consumption.
- Easy access Ball Collector for removal of worn balls and insertion of new cleaning balls.
- Site Glasses to confirm cleaning ball recirculation in various locations.
- Advanced controls via HMI touch screen interface with PLC to provide instant change of various control settings (times on/off, cycle time, etc.), viewing of component status, run times, maintenance requirements and faults.
- Design codes to ASME, Nuclear or Petro-Chemical industry standards.

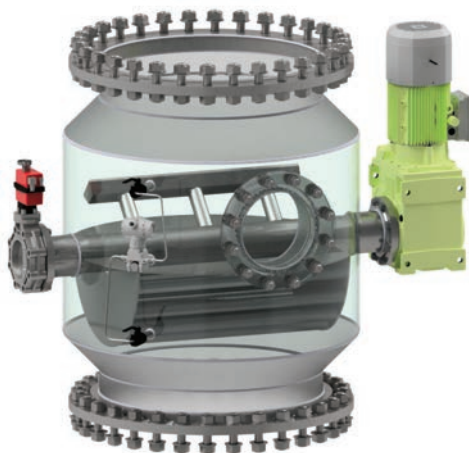
## Options

- Emergency bypass within PBR Ball Strainer for unforeseen circumstances.
- Inverted V strainer for systems with no upstream prescreening to allow backwashing.
- Ball sorter to confirm worn cleaning balls.
- Ball counter to monitor the number of balls in circulation.
- Batch release or continuous circulation.

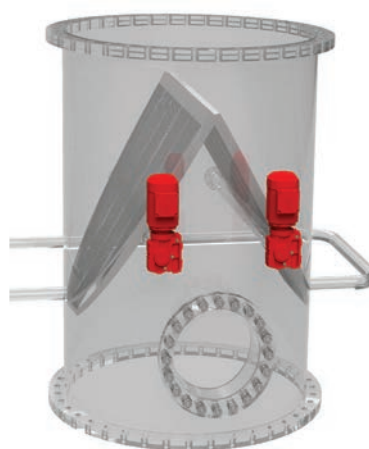


Various sizes and types of cleaning balls

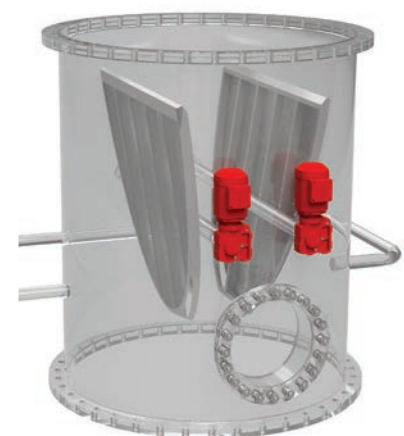
Available Strainer Options - PBR (Positive Ball Retention), "V" style or Single Element, (not shown)



**PBR Strainer**



**"V" Strainer  
Collection Mode**



**"V" Strainer  
Backwash Mode**

(Smaller pipe diameters will use a backwashable single element inclined strainer, not shown above)

The CTCS is effective for eliminating scaling, fouling, MIC attack, surface pitting and under deposit corrosion, while extending tube life and improving heat rate.

# CTCS Sizing Data

Plant / Site Name \_\_\_\_\_

Site Location \_\_\_\_\_ (City, State, Country)

Water Source \_\_\_\_\_ Fresh \_\_\_\_\_ Brackish \_\_\_\_\_ Sea

Once Thru or Tower \_\_\_\_\_ Thru \_\_\_\_\_ Tower

Site Conditions \_\_\_\_\_ New \_\_\_\_\_ Existing

Water Boxes / Passes Dual  Single  Split No. of Passes  Single  Dual

Number of Lines \_\_\_\_\_ Size of Pre-Screening \_\_\_\_\_

Flow Rate per Line \_\_\_\_\_ GPM \_\_\_\_\_ M3/sec \_\_\_\_\_ MGD

Max Flow per Line \_\_\_\_\_ GPM \_\_\_\_\_ M3/sec \_\_\_\_\_ MGD

Line Diameter (each) \_\_\_\_\_ Inch \_\_\_\_\_ mm

Line Pressure \_\_\_\_\_ PSIG \_\_\_\_\_ kPa

Available Install Distance \_\_\_\_\_ Inch \_\_\_\_\_ mm

Tube OD / Wall Thickness \_\_\_\_\_ / \_\_\_\_\_ Inch \_\_\_\_\_ / \_\_\_\_\_ mm

Tube Length \_\_\_\_\_ Feet \_\_\_\_\_ m

No. of Tubes per Box \_\_\_\_\_ Total per Condenser \_\_\_\_\_

Desired Internal Coating \_\_\_\_\_ Rubber Lined \_\_\_\_\_ Epoxy

Desired Internal Materials \_\_\_\_\_ 316L SS \_\_\_\_\_ Duplex 2205 \_\_\_\_\_ Super Duplex 2507

Typical Fouling Issues \_\_\_\_\_

Main Power \_\_\_\_\_ Voltage \_\_\_\_\_ Phase \_\_\_\_\_ Hertz

Special Options \_\_\_\_\_

**CONTACT DETAILS**

Company Name \_\_\_\_\_

Contact Person Name \_\_\_\_\_

Email and Phone Number \_\_\_\_\_



Tel: 801.713.9933  
wtengineering.com  
info@wtengineering.com  
Salt Lake City, Utah, USA

Represented by: