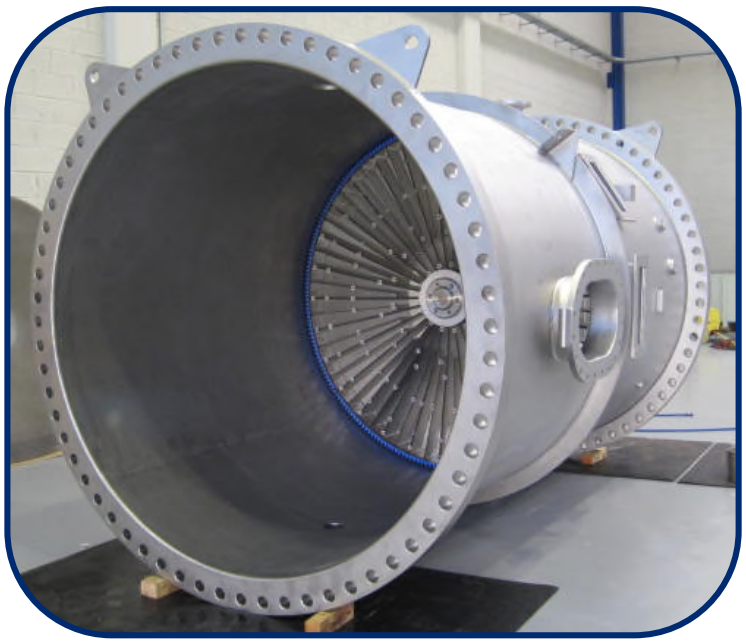
ZERO BALL LOSS (ZBL)

CONDENSER TUBE CLEANING SYSTEM



PURPOSE

- This is a sponge-ball type tube-cleaning system. This equipment is the improved version of the standard CTCS system.
- In spite of upstream screens and strainers:
  - ◊ Dissolved chemicals precipitate and build into scale on the tube surface;
  - ◊ Biological elements settle and grow on the tube surface;
  - ◊ Fine mineral particles deposit on the low-velocity boundary and combine with the biological growth.
- As a result, the heat transfer by the tubes is much reduced and the plant's loss of generation can be 3% or more.
- Fitting a BEAUDREY ZBL CTCS eliminates the above problems. The system is used in all plants with tubular exchangers and condensers.

DESCRIPTION

- The water enters the ball-catcher cylindrical, flanged spool piece with a rotating screening wheel divided into a number of deep, radial, ball-collection compartments. The downstream face of the compartments is fitted with the patented, low head-loss NO-CLING™ screening element. The balls are arrested and stored in the compartments. The wheel is driven and rotates. Each compartment passes in front of an upstream scoop which is connected to the skid-mounted ball pump, concentrator and ball collector.
- The optional ball counter and undersize ball remover are also skid mounted.
- When in circulation, the balls travel back to the upstream side of the condenser where they are injected into the incoming cooling water. As the size of the balls is slightly larger than the diameter of the tubes, they squeeze into the tubes, pushed by the condenser head-loss.
- The balls sweep the tubes clean before exiting from the condenser towards the ball catcher.

ADVANTAGES

- No possible ball escape to the environment
- Very economical (costs less than a grid-type system)
- Constant efficiency
- Very compact, fits where no other system fits
- Proven and reliable
- Eliminates periodical shut-downs for manual tube-cleaning
- Eliminates periodical chemical cleaning
- Can easily be retrofitted to existing plants
- Short pay-back time (often less than 18 months)
- Low added head-loss

BEAUDREY
Water Screening Since 1912

BEAUDREY ZBL VS. CONVENTIONAL GRID-TYPE TUBE CLEANING SYSTEMS

GRID-SYSTEM PROBLEMS	BEAUDREY ZBL SOLUTION
High ball loss caused by a damaged grid, incorrect grid positioning, or a grid clogged with debris.	Designed so that there is no escape path for the sponge balls, making the Beaudrey ZBL environmentally compatible.
Ball count can drop below the optimal level as they are leaked out of the tube cleaning system.	The Beaudrey ZBL is equipped with a continuous ball monitoring system that will trigger an alarm if the ball count is low (option).
Worn out balls circulating through the systemare not efficient due to undersized diameter.	Undersize balls are automatically removed from the condenser during the continuous ball sorting process of the ZBL (option).
With traditional systems, it can be a hassle to add more sponge balls since the ball collector has to first be dismantled.	The challenge is eliminated with the online sponge ball adding system; the balls can simply be added while the system is running.
Traditional systems have turbulence-type extraction chambers which are susceptible to debris build up and are affected by variations in the flow patterns of the water.	In the Beaudrey ZBL, ball extraction is performed by a powerful, backwash that can withstand inconsistencies in flow patterns and debris build up.

Components	Materials for Fresh Water Applications	Materials for Seawater applications
Shell	Painted CS	Lined CS, Duplex Super Duplex
Internals	304L 316L	316L Duplex Super Duplex
Ball-arresting grids	304L 316L	316L Duplex Super Duplex
Ball pump	Cast iron internally lined	316L Duplex Super Duplex
Ball Collector	304L 316L HDPE	316L Duplex Super Duplex
Skid pipework	HDPE	HDPE

SIZES AND STANDARDS

- Standard sizes from DN500 (12”) to DN3200 (128”)
- Larger machines and special shell dimensions on special order
- Head-loss about 1.5 $V^2/2g$ in most cases, “V” being the inlet velocity in the spool piece.
- Ball strainers are designed and manufactured in accordance with international standards:
  ISO-DIN-ASME-AWWA.

ANCILLARIES AND OPTIONS

- Necessary ancillaries
  - Differential pressure sensor
  - Electrical control cabinet
- Optional features
  - Inspection manholes
  - Undersize ball sorter / remover
  - Ball counter
  - Flow straightener
  - Special design to fit in restricted, existing locations

Contact us for a quote at
www.beaudrey.com/contact

BEAUDREY
Water Screening Since 1912