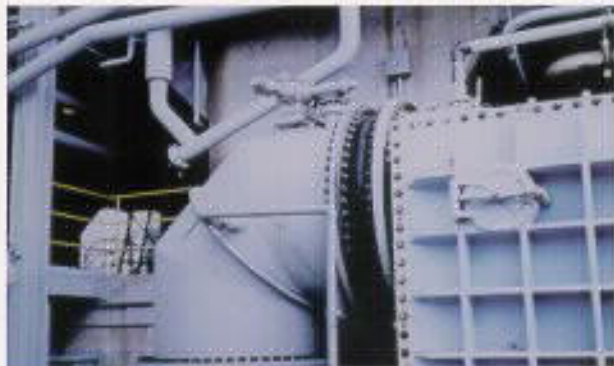


# Automatic Tube Cleaning System



**BRACKETTGREENWSA, INC.**  
ADVANCED CONDENSER PERFORMANCE TECHNOLOGY

*Clean & Simple*



Wear-resistant elastomeric rubber balls are available in a variety of diameters, weights, hardness, and surface textures to fit the specific needs of your operation.



### Fouled tubes cut production

Microfouling and scaling in heat exchanger and condenser tubes cut efficiency and shorten service life. For the power plant, lower efficiency means lower turbine output. The numbers are significant: efficiency loss, and the resultant production loss, can be as high as 25%.

### Temporary solutions ineffective

Productivity lost during downtime for tube cleaning can never be recovered. Mechanical cleaning demands outage time. Chemical treatment to control fouling and scaling is environmentally unsound and hazardous to your workers. Both approaches are costly, time-consuming and labor-intensive. And they must be performed over and over again.

### A permanent solution

There is a permanent and cost-efficient solution to a perennial maintenance problem. Twenty-four hours a day, BG-WSA's Automatic Tube Cleaning System (ATCS) wipes out scale deposits and microfouling to increase reliability, performance, plant output and service life.

### That pays for itself

ATCS eliminates the maintenance costs associated with off-line cleaning. There is no need for the downtime mandated by mechanical and chemical methods. BG-WSA on-line automatic tube cleaning system (ATCS) rapidly pays for itself through increased heat transfer efficiency and higher plant production. It significantly reduces corrosion and prevents tube failures caused by fouling and scaling while removing the cost and hazard of continuous chemical treatment. Year after year, ATCS savings pay off.

### A simple, yet effective concept

BG-WSA uses a simple, yet highly effective concept to wipe out tube contaminants. The ATCS injects elastomer rubber balls slightly larger than the tube diameter into the water supply line. Cooling water flow forces them through the condenser tubes. As they pass through the tubes, the balls wipe the tubes clean of deposits and continually remove silt, scale and biological fouling. A strainer section in the cooling water outlet pipe extracts the balls and a centrifugal pump moves them into a collector section ready for the next cycle. Ball circulation can be continuous or intermittent depending on site specifics.

### That is precision-designed

Sound engineering and meticulous attention to detail mean trouble-free operation. BG-WSA engineers match the type, diameter, weight, hardness, and surface texture type of the balls to the specific needs of your operation and carefully select the injection method to ensure proper ball distribution. Pressure drop remains negligible. A differential pressure monitor displays pressure drop across the strainer section, while patented vortex and turbulence promoters at the strainer outlet point ensures complete ball recovery. Provision has also been made to turn the screens to the backwash position to clear accumulated debris.

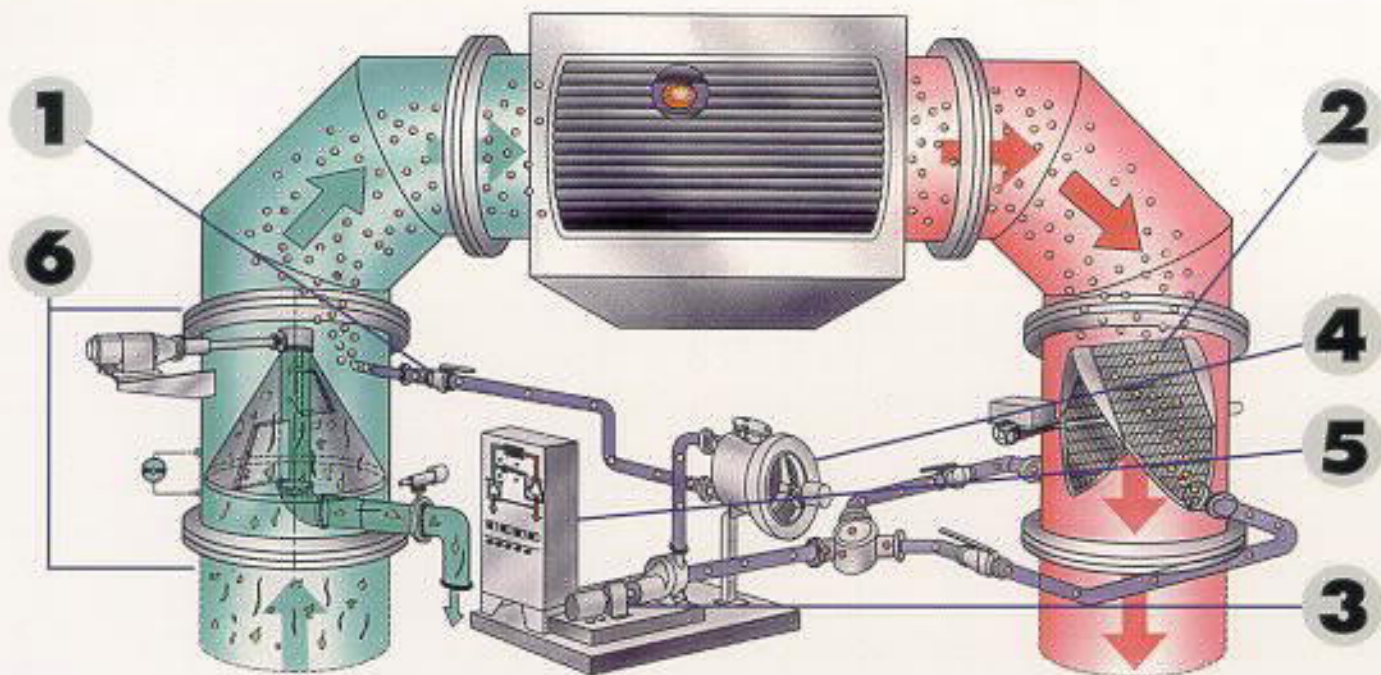
### And matched to your needs

BG-WSA builds in flexibility for precise configuration to site specifics. ATCS tackles scaling problems in both high and low temperature applications in all types of tubes, including stainless steel, titanium and copper-based alloy. Plant engineers can select continuous, intermittent or manual cycles. They can also add options that will monitor the number of balls in circulation and indicate the quantity of worn balls that can no longer be effective.

### For a better bottom line

Automatic tube cleaning technology has improved efficiency for more than 4,000 companies around the world. Its quietly dependable performance has been field-proven for more than two decades in a wide array of industries that include power generation (fossil, nuclear, geothermal and cogeneration), processing, refining, petrochemicals and desalinization. For an on-site demonstration, case studies or free videotape, call BG-WSA today or access our website at [www.bgwsa.com](http://www.bgwsa.com).

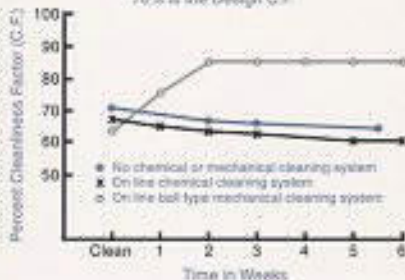
# How it works



## Cost Savings

### Condenser Cleanliness Factor vs. Time

70% is the Design C.F.



### System cost for all four units

|                            |           |
|----------------------------|-----------|
| Equipment and installation | \$500,000 |
| Annual operating cost      | \$3,500   |

### Annual savings for all four units

|   |             |
|---|-------------|
| Reduced steam consumption                                   | \$950,000   |
| Elimination of unit shutdown and additional available power | \$2,500,000 |

- 1** Injection nozzles through which balls enter the system against the cooling water flow to ensure proper distribution.
- 2** Custom-made strainer section collects the balls and moves them through the exit point toward the recirculation pump.
- 3** Non-clogging, open-impeller recirculation pump adds sufficient pressure to remove the balls from the strainer and return them to the injection point.
- 4** Ball collector automatically takes balls out of, or releases them into, circulation. Collector also allows easy and quick access for replacing worn balls.
- 5** The central control unit uses a series of PLCs to monitor operation of the entire system.
- 6** Optional self-flushing debris filter to remove macro fouling, fibrous and coarse debris from the intake cooling water.



## One Size Doesn't Fit All

Every solution is customized to your needs. BG-WSA produces a wide range of strainer and automatic tube cleaning system sizes and capacities.

### A Vital Second Line of Defense

Any debris or microfouling problems? Despite pre-screening technology at raw cooling water intake sites, additional filtering is often necessary.

Access our website for more details of BG-WSA  
**online self-flushing debris filter - [www.bgwsa.com](http://www.bgwsa.com).**

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