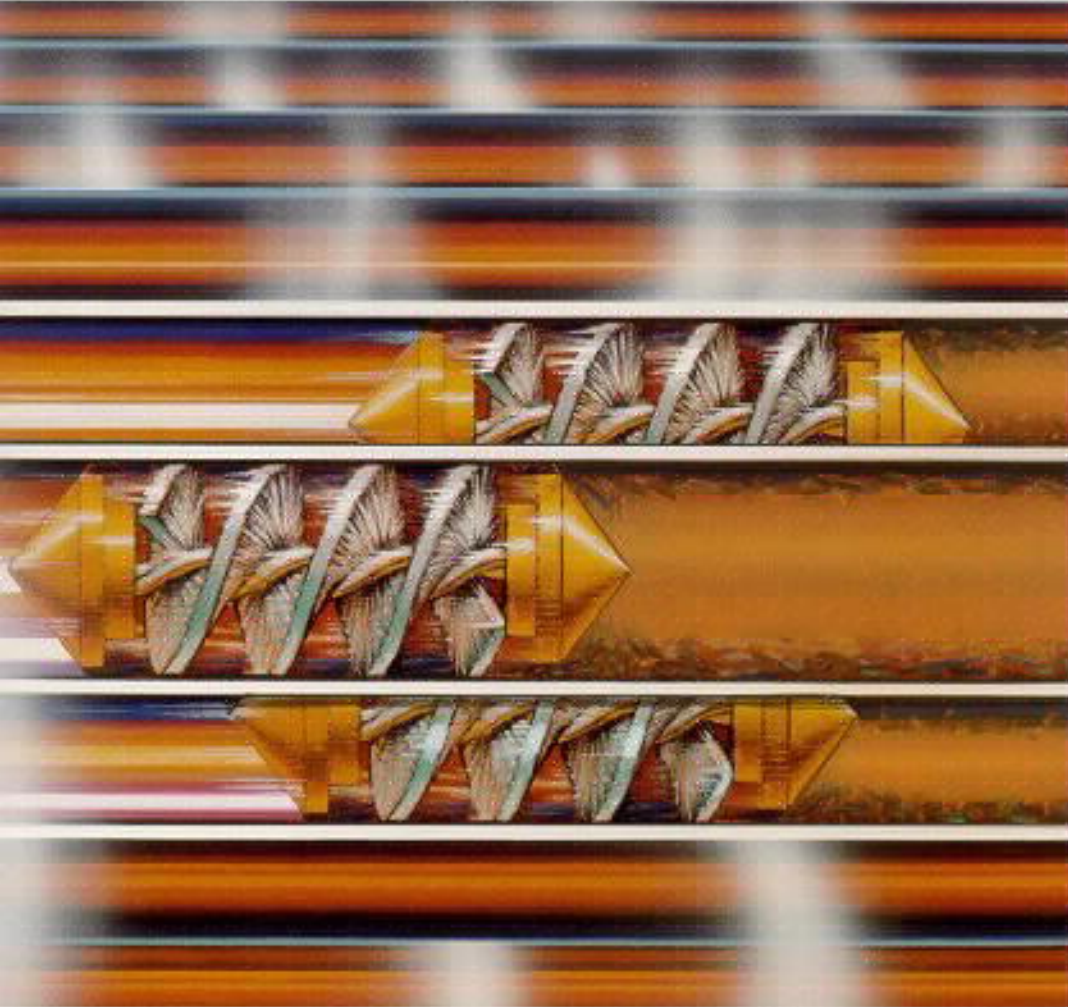


WSA ENGINEERED SYSTEMS



BRUSH-TYPE AUTOMATIC TUBE CLEANING TECHNOLOGY



**CLEAN
AND
SIMPLE**

THE CLEAN AND SIMPLE SOLUTION TO TUBESIDE FOULING

If you are responsible for a heat exchanger, chiller, or condenser, then you know tubeside fouling reduces your heat transfer coefficient. That can cut your efficiency by as much as 25 percent with a corresponding loss in production. Furthermore, fouling contributes to tube corrosion and failure.

Off-line cleaning methods are temporary solutions that require plant shutdown. That means lost productivity that cannot be recovered.

In addition, off-line or chemical cleaning methods can be costly, time-consuming, labor intensive, environmentally unsound, and hazardous to workers.

A Permanent Solution

The WSA Brush-Type Automatic Tube Cleaning System can help you permanently solve the problem of fouling and deposits. It will keep your system working at maximum efficiency by automatically keeping tubes clean without requiring plant shutdown. Plus, a WSA Automatic Tube Cleaning System will significantly reduce tube corrosion and eliminate tube failure caused by fouling and scaling.

In a short time, a WSA system will pay for itself by increasing heat transfer efficiency, plant production, and eliminating maintenance costs associated with off-line cleaning.

Brush System Easily Installed, Eliminates Foulants

The WSA Brush-Type Automatic Tube Cleaning System wipes off foulants to maintain condenser performance and heat exchange rate at optimum efficiency. Our brush-type system uses only four components and does not restrict water flow while keeping the tubes free of deposits and foulants.

Thumb-sized nylon brushes are inserted into each condenser tube. Catch baskets are epoxied at the ends of the tubes. Brushes are slightly larger than the inside diameter of tubing to create an interference fit. This ensures positive brushing action across the entire internal tube surface. A nose cone on each end of the brushes streamlines the movement while providing a piston-type seal. Corrosion-free titanium wire is used to fasten the nylon bristles to the nose cones.

WSA Diverter Valve Reduces Installation Cost

The WSA four-way flow reversing diverter valve reverses fluid flow without interrupting the heat exchange/condensor operation. This moves brushes from one end of the tube to the other.

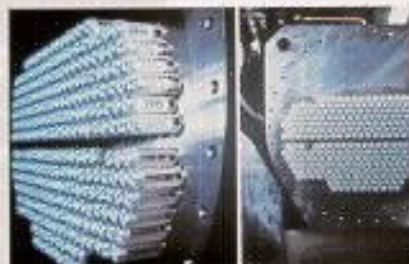
You determine how often, and when, to activate the cleaning process. Our control panel automatically returns flow to normal forward direction when the cleaning phase is complete.

Our flow diverter reverses flow through



A 36-inch line size diverter for 25,000 gpm flow.

Flow is periodically reversed by a WSA programmable diverter valve.



Brushes and catch baskets are installed at both ends of all condenser tubes.



A force-fit, four-prong end clip with anti-vibration tabs.

Nylon brushes clear inner tube walls to increase heat transfer coefficient by as much as 25 percent.

condenser or heat exchanger tubes while maintaining the same flow direction through supply and return lines.

Our unique LPD style flow diverter eliminates the need for the 8 to 12 elbows required for conventional valves. We custom manufacture valves to meet most piping configurations to substantially reduce installation costs.

Timer Provides Accurate Control of Cleaning Process

An electric, programmable timer is housed in a NEMA 4X UL-approved control panel. This timer actuates the diverter valve. Flow reversal can be set at predetermined intervals. The flow

continues in the reversed direction for about one minute, then the timer returns the diverter valve to normal flow position. Brushes run the length of the tubes twice during each cycle.

Baskets Provide Access to Tubes For Close Inspection

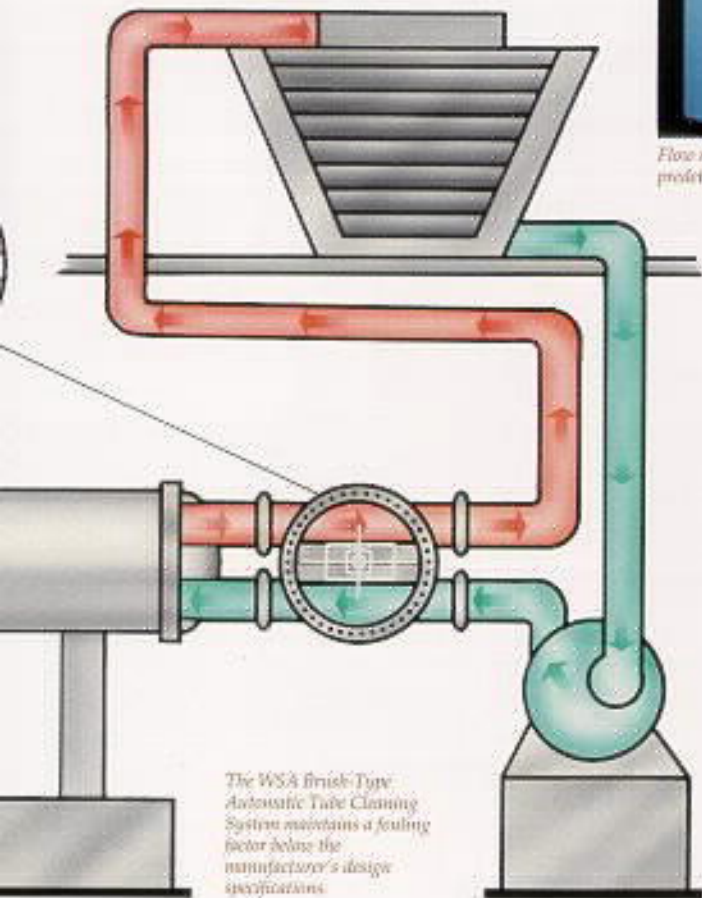
Special epoxy affixes catch baskets at the end of each tube. These baskets are pull tested to assure secure attachment. The outermost end of the basket has a force-in, four-prong end clip that permits access to the brushes and tubes without dismantling. This allows for easy brush replacement.

The WSA Brush-Type System For a Better Looking Bottom Line

- Increase heat transfer coefficient and heat recovery by as much as 25 percent
- Extend tube and condenser life by reducing corrosion and pitting
- Reduce use of chemicals
- Reduce water consumption
- Eliminate costly shutdowns
- Allow for more productive use of maintenance resources, both financial and human



Flow reversal can be set at predetermined intervals.



The WSA Brush-Type Automatic Tube Cleaning System maintains a fouling factor below the manufacturer's design specifications.



We custom manufacture flow diverter valves to substantially reduce installation costs.



Stainless steel brushes are for process applications and harsh conditions.

WSA ENGINEERED SYSTEMS

Your Single Source For Clean and Simple Tube Cleaning Technology

For more than 20 years, WSA has led the industry with advanced solutions in automatic tube cleaning technology. Today, no company offers more kinds of high quality on-line tube cleaning systems employing ball-type or brush-type technology.

You can trust WSA to have the advanced technology and service to keep your operation running efficiently and trouble-free.

- One-on-one technical support and service to assure proper selection, installation, and operation.
- Preliminary engineering and installation drawings for retrofit piping modifications.
- All fabrication conducted at our ASME manufacturing facility in Milwaukee, Wisconsin.
- Our engineering, design, and construction is done according to all industrial standards and guidelines.

The WSA Brush-Type System Is Ideal For:

Chiller Industry

- Institutional Comfort Cooling: Hotels, Hospitals, Educational, Office Buildings and Airports,
- Process Cooling: Petrochemical, Industrial Plants and Gas Processing

Refining Industry

- Refineries
- Chemical Plants

Utility Industry

- Cogeneration Plants
- Fossil Fuel Power Plants
- Nuclear Power Plants

Automatic Tube Cleaning Technology has improved efficiency for more than 4,000 companies around the world, including...

3M
Allied Chemical
Amoco Oil Company
Baltimore Gas and Electric
Black & Veatch
California Energy Company
Chevron Oil
Compaq Computer
Dow Chemical
DuPont Company
Electric Generation Authority of Thailand
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For an on-site demonstration, or more information, including case studies and a free videotape, call us today.

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