



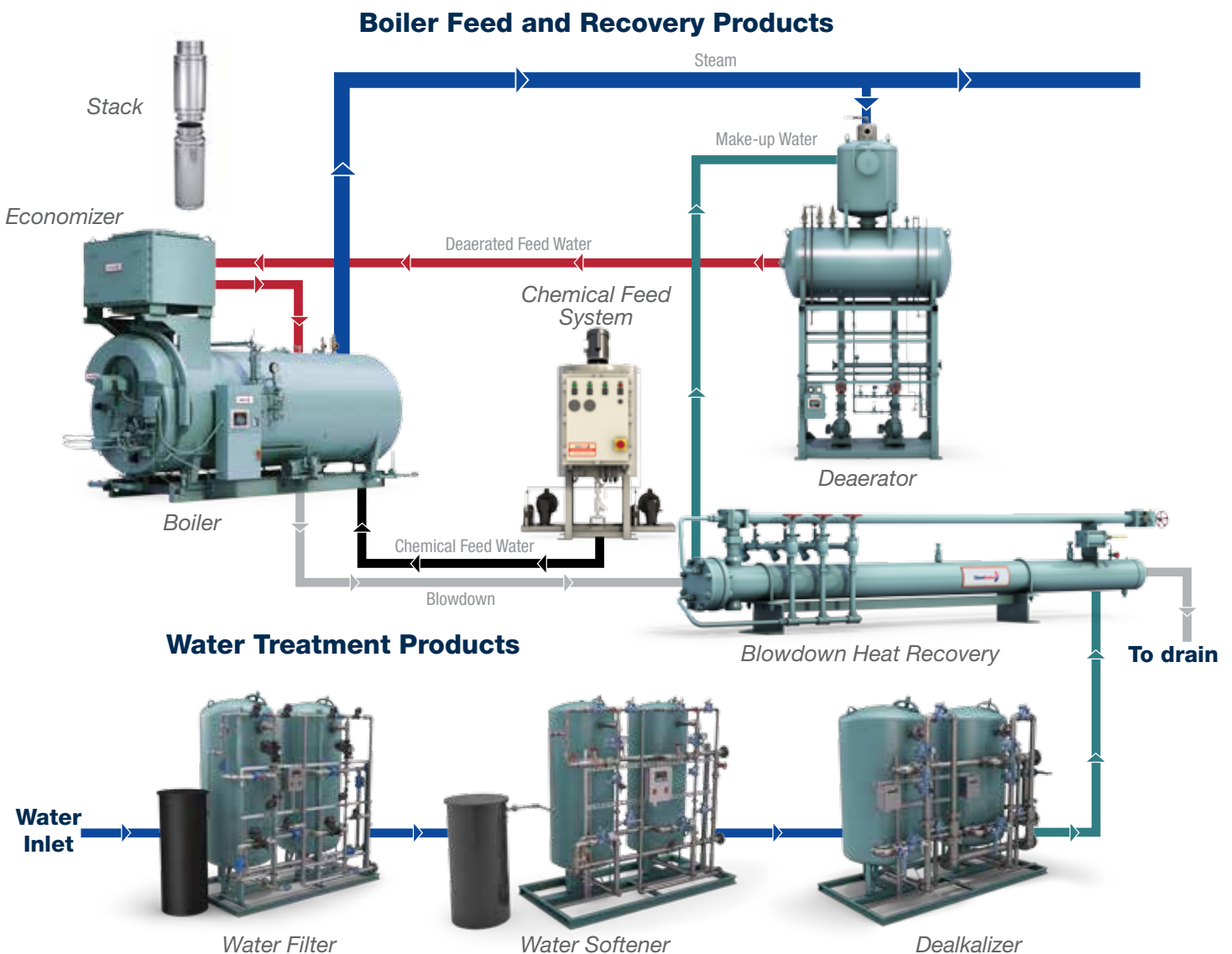
WATER TREATMENT SYSTEMS

Improve performance, protect your system, and save money

TOTAL WATER TREATMENT INTEGRATION FROM A SINGLE SOURCE.

Cleaver-Brooks is the leading provider of boiler water systems, including both water treatment and boiler feed and condensate recovery products, and the only totally integrated single-source supplier in the world. Other manufacturers rely on equipment from a variety of sources, simply bolted together, which can jeopardize compatibility, performance, and quality. Cleaver-Brooks products are designed for high efficiency and meet the most stringent emissions requirements in the United States. From pre-treatment to post-treatment, water treatment to separators, our engineering ensures the solutions are designed to meet the needs of your boiler system and your specifications. With state-of-the-art technology and expertise built over 80 years in the industry, we can meet practically any water treatment need.

The Steam System





Overview of Water Treatment Systems

| PRE-TREATMENT EQUIPMENT PRODUCTS | Model | Steam | Hot Water | Capacity | Features |
|----------------------------------|--------------------------------|-------|-----------|----------------------------------|---|
| | WATER SOFTENERS | | | | |
| | SMR and FMR | • | • | 20,000–1,500,000 grains exchange | Flow rates from 2 to 450 gpm. Compatible with all boiler applications. |
| | FSE and SSE | • | • | 20,000–1,200,000 grains exchange | Flow rates from 8 to 350 gpm. Operating temperatures from 40° to 100° F. |
| | CRS | • | • | 15,000–450,000 grains exchange | Flow rates from 12 to 45 gpm. Valves and control pre-wired and ready to program. |
| | DEALKALIZERS | | | | |
| | CDAS | • | • | 50,000–980,00 grains | Flow rates from 10 to 300 gpm. Tank sizes 20" to 72". |
| | CDAF | • | • | 10,000–100,000 grains | Flow rates from 2.5 to 50 gpm. Tank sizes 9" to 30". |
| | FILTRATION SYSTEMS | | | | |
| | FBS | • | • | ----- | Flow rates from 10 to 800 gpm (depending on media filter). |
| | FBF | • | • | ----- | Flow rates from 2 to 96 gpm. Top-mounted, fully adjustable, brass control valves. |
| | CHEMICAL FEED SYSTEMS | | | | |
| | CFS | • | • | Pressure up to 1,000 psig | Tank sizes from 20 gal to 500 gal. 0.015 gph to 60 gph, fully adjustable pumps. |
| | REVERSE OSMOSIS SYSTEMS | | | | |
| | CRO | • | • | 14,000–72,000 gpd | 10 gpm to 50 gpm systems. Available for steam and hot water applications. |

| POST-TREATMENT EQUIPMENT PRODUCTS | Model | Steam | Hot Water | Features |
|-----------------------------------|---|-------|-----------|---|
| | SAMPLE COOLERS | | | |
| | SC | • | • | Steam boilers use Model SC-42. Hot water boilers use Model SC-22. |
| | BLOWDOWN SEPARATORS | | | |
| | BDS | • | • | Handles boiler operating pressure from 0 to 300 psig. |
| | BLOWDOWN TANKS | | | |
| | BDT | • | • | Simple, easy-to-maintain design. 18" to 72" tanks. |
| | BOILER WATER TREATMENT CONTROLLERS | | | |
| | CLC | • | • | Microprocessor control. Includes ball valve, plumbing kit, orifice plate and conductivity sensor. |
| | EXHAUST SILENCERS | | | |
| | CSP | • | | Noise reduction from 24.4 to 48.4 dB (depending on model). |
| | EXHAUST HEADS | | | |
| | CEX | • | • | Self-cleaning and self-draining. |
| | CENTRIFUGAL SEPARATORS | | | |
| | CIS | • | | Vertical and horizontal configurations of many sizes available. |
| | MIST SEPARATORS | | | |
| | CMS | • | | Provides dry steam. Decreases boiler water level fluctuations. |
| | FLASH SEPARATORS | | | |
| | FSS | • | | ASME code stamp. Fast ROI. |

Pre-Treatment Equipment Products

Cleaver-Brooks pre-treatment equipment is used before the water reaches the boiler and treats water to the quality required for successful boiler operation, and is appropriate for both hot water or steam boiler applications. This equipment will help protect the boiler equipment by providing maximum high-quality treated boiler feed water.

Water Softeners

Our ion exchange water softeners remove water hardness, preventing scale buildup on heat transfer surfaces, and help maintain peak boiler efficiency. Removing hardness also reduces the need for expensive chemical water treatment to control scale. Cleaver-Brooks water softeners are available in package design for virtually any commercial or industrial application. A water softener is recommended whenever raw water hardness exceeds 1 ppm. Water softeners are available for boilers of all sizes, including multiple boilers, steam or hot water.

Model SMR and FMR

Available in single, twin, or triplex tank designs and include resin tank(s), brine tank, resin, face-piping, diaphragm valve nest, and cycle controller. It features carbon steel tanks with epoxy-lined interiors and utilizes water-activated diaphragm valves and an electronic controller.



Features

- Compatible with all boiler applications
- Sized from 20,000 to 1,500,000 grains exchange capacity
- Flow rates from 2 to 450 gpm
- Galvanized steel exterior piping with cast iron fittings
- Inlet/Outlet pressure gauges
- NEMA 4 electrical enclosures
- Optional skid mounted and pre-piped, pre-wired systems
- ASME code stamped tanks optional

Models FSE and SSE

Available in single, twin, triplex, or quadraplex tank designs and include resin tank(s), brine tank, resin, piping, multi-position top-mounted piston valves, flow meters and electronic demand controller. FSE model has plastic tanks for easy installation. SSE model has steel tanks with top mount valves.



Features

- Compatible with all boiler applications
- Sized from 20,000 to 1,200,000 grains exchange capacity
- Flow rates from 8 to 350 gpm
- Tank sizes: 9" to 48" diameter standard (larger diameters available)
- Operating temperatures: 40° to 100° F
- Water meter for automatic regeneration
- ED electronic controls with 24-volt operation
- Spray lined steel or FRP plastic tanks
- Optional skid mounted and pre-piped, pre-wired systems
- ASME code stamped steel tanks optional

Model CRS

Cross-over twin alternating systems with plastic tanks and a single top-mount valve that controls both tanks. Includes resin tanks, brine tank, single valve with CRS controller, and interconnecting piping. They provide a continuous supply of softened water with one tank in service and one tank either regenerating or in standby. Solid-state CRS controls provide a simple, reliable operation.



Features

- Compatible with all boiler applications
- Sized from 15,000 to 450,000 grains exchange capacity
- Flow rates from 12 to 45 gpm
- Tank sizes: 7" to 30" diameter
- Operating temperatures: 40° to 100° F
- Water meter for automatic regeneration
- Valve and control come pre-wired and ready to program. Simply plug in the 24-volt transformer, twist on turbine cable, and the installation is complete
- Optional skid mounted

Dealkalizers

Dealkalizers can remove more than 90% of the bicarbonate alkalinity in a softened water supply. This controls formation of carbon dioxide in the boiler, the major cause of condensate line corrosion. Dealkalization reduces the need for neutralizing chemicals by as much as 90%, and cuts fuel cost by minimizing blowdown.

Model CDAS

The CDAS is designed for larger industrial boiler-feed applications. It features twin tank, alternating or parallel systems including carbon steel resin tanks, strong-base anion resin, diaphragm style control valves, inlet/outlet sampling valves, galvanized steel face piping, brine tank, and caustic injection system.



Features

- Compatible with all boiler applications
- Sized from 50,000 to 980,000 grains capacity
- Flow rates from 10 to 300 gpm
- Tank sizes: 20" to 72".
- Pipe size: 1½", 2", 2½", 3", and 4" NPT
- Water meter initiated regeneration
- Optional skid mounted and ASME code stamped resin tanks

Model CDAF

Chloride-cycle dealkalizer system reduces incoming alkalinity in feed water resulting in lower blowdown rates, lower condensate return corrosion, and more effective chemical treatment program for boiler systems.

Features

- Compatible with all boiler applications
- Sized from 10,000 to 100,000 grains capacity
- Flow rates from 2.5 to 50 gpm
- Tank sizes: 9" to 30"
- Pipe size: ¾", 1", and 1½"
- Water meter initiated regeneration
- Optional skid mounted and pre-piped, pre-loaded system
- Fiberglass Reinforced Plastic (FRP) resin tanks

Filtration Systems

Raw water analysis can easily determine the need for special filter equipment for removal of impurities. The cost of these systems is quickly recovered by eliminating need for frequent equipment cleaning and servicing, inefficient performance, damage to system components, and premature equipment failure.

Model FBS

FBS water filters feature carbon steel media tanks with NSF 61 epoxy tank lining. The exterior piping is galvanized steel with cast-iron fittings and control valves. They offer the same filtration capabilities as the FBF Series.



Features

- Compatible with all boiler applications
- Flow rates from 10 gpm to 800 gpm, depending on filter media
- Pipe sizes from 1" to 8" available
- NEMA 4X electrical enclosure
- Optional ASME code stamped tanks
- Optional skid mounted, pre-piped, pre-wired systems
- Optional PVC, CPVC, copper, or stainless steel exterior face piping

Model FBF

The FBF Series provides the latest technology in fiberglass tanks with top-mounted control valves. Only the filter media needs to be changed to successfully treat a variety of water problems. Cleaver-Brooks Series FBF water filters can treat for sediment removal, iron, manganese, hydrogen sulfide removal, acid neutralization, and chlorine removal.

Features

- Compatible with all boiler applications
- Flow rates from 2 gpm to 96 gpm
- Pipe sizes: 1", 1½", 2" and 3"
- Seamless non-metallic fiberglass tanks for maximum corrosion resistance
- Top-mounted, fully adjustable, brass control valves
- One-third the shipping weight of steel tanks
- Single, twin, and triplex systems available

Chemical Feed Systems – Model CFS

Chemical feed systems treat boiler feedwater and condition blowdown and provide an extra measure of protection against scaling and corrosion. Automatic systems are available for single or multiple boiler installations. They are fully packaged and can be equipped with either piston or diaphragm pumps. Cleaver-Brooks also has available bypass feeders and shot feeders.



Features

- For steam and hot water applications
- Available for any boiler size
- Tank sizes from 20 gal to 500 gal
- Tank materials; poly, carbon steel, stainless steel, and overpack
- Pressure up to 1,000 psig
- 0.015 GPH to 60 GPH, fully adjustable pumps

Reverse Osmosis Systems – Model CRO

Designed for boiler water treatment applications and provides high-purity water (98–99% salt reduction). Our Reverse Osmosis systems remove dissolved minerals, particles, and organic impurities. Like all Cleaver-Brooks systems, they are constructed using the highest-quality components and materials, for exceptional performance.

Features

- Steam and hot water applications
- Available for any boiler size
- 10 gpm - 50 gpm systems
- 14,400 to 72,000 gpd capacity
- NEMA 4 control panel
- Skid mounted, fully packaged
- Many options available to meet your application requirements

Post-Treatment Equipment Products

Post-treatment equipment is mounted after water passes through the boiler, and is used for boiler blowdown, surface blowdown control, sampling, cooling, silencing, and separation of contaminants.

Sample Coolers

Model SC

Cleaver-Brooks sample coolers allow testing of the boiler quality without having to shut down the boiler. They cool boiler water samples with minimum disturbance to system pressure. They are easily mounted, piped and low maintenance.

Features

- Steam boilers use Model SC-42
- SC-42 cools steam or water samples up to 1,000°F and 5,000 psig
- Hot water boilers use Model SC-22
- SC-22 cools hot water samples up to 850°F and 2,000 psig
- Flow rates up to 1.5 gpm
- Shell and coil made of stainless steel

Blowdown Separators

Model BDS

Designed for blowoff from a boiler, it enhances boiler blowdown effectiveness and helps protect a boiler from buildup of harmful solids, severe scaling, and corrosion. It also helps prevent thermal pollution. Blowdown separators are compact and can help save valuable floor space when compared to a blowdown tank.

Features

- Steam and hot water applications
- Carbon steel with stainless steel striking plate
- Handles boiler operating pressure from 0 to 300 psig
- Valve sizes from 1" to 2½"
- Includes automatic drain aftercooler
- Available with ASME "U" stamp



Blowdown Tanks

Model BDT

Cleaver-Brooks BDT Series blowdown tanks allow boiler blowdown to accumulate in the bottom of the tank and cool so that at the next blowdown the water mixes and is cooled to drain. This helps meet codes and eliminate thermal pollution. They also provide low-velocity-release of steam so additional vent appliances are not needed. Noise levels are kept below 90 dB(A).

Features

- For steam and hot water applications
- Available for any boiler size
- Simple, easy-to-maintain design
- ASME Code rated vessel
- 18" to 72" diameter tanks
- Carbon steel tank with stainless steel striking plate

Boiler Water Treatment Controllers

Model CLC

These controllers provide automatic boiler surface blowdown using conductivity or water meter input. They can provide continuous sample, sample/cycle, and sample/hold control of boiler conductivity. Automatic surface blowdown will help protect the boiler and reduce downtime.

Features

- For almost any boiler size
- Microprocessor controls
- NEMA 4X enclosure
- Includes motorized ball valve, plumbing kit, orifice plate, and conductivity sensor
- Can also control chemical feed pumps

Exhaust Silencers

Model CSP

Cleaver-Brooks CSP Series exhaust silencers are engineered to provide maximum attenuation of both low and high frequency noise from steam exhausting to atmosphere, as it occurs in boiler blowdown or when venting the system.

Features

- Steam boilers
- Noise reduction from 24.4 to 48.4 dB, depending on model
- Internal diffusers with additional acoustical packing
- No removable parts and no scheduled maintenance

Exhaust Heads

Model CEX

Cleaver-Brooks CEX Series cyclone exhaust heads centrifugally release entrained water, oil, and dirt, leaving only clean, dry exhaust. The large exhaust opening reduces velocity and minimizes exhaust noise. It helps prevent damage to roof, walls, vehicles parked nearby, and unsightly icing and dirt accumulation.

Features

- Steam and hot water applications
- For any size boiler
- Self cleaning and self draining

Centrifugal Separators

Model CIS

Cleaver-Brooks CIS Series inline separators are used to clean up steam and remove moisture from boiler systems. They help provide steam of 99.8% quality. They use a cyclonic spinning action to provide entrainment separation.

Features

- For steam applications
- Available for any boiler size
- Simple, easy-to-maintain design
- Vertical and horizontal configurations of many sizes available

Mist Separators

Model CMS

Cleaver-Brooks CMS Series mist separators are used to remove entrained liquid droplets from steam. A special mist eliminator pad removes entrained liquid droplets and allows only vapors through the mesh. They can be used on boiler steam lines and steam vents.

Features

- Steam applications
- Available for any boiler size
- Provides dry steam
- Decreases boiler water level fluctuations

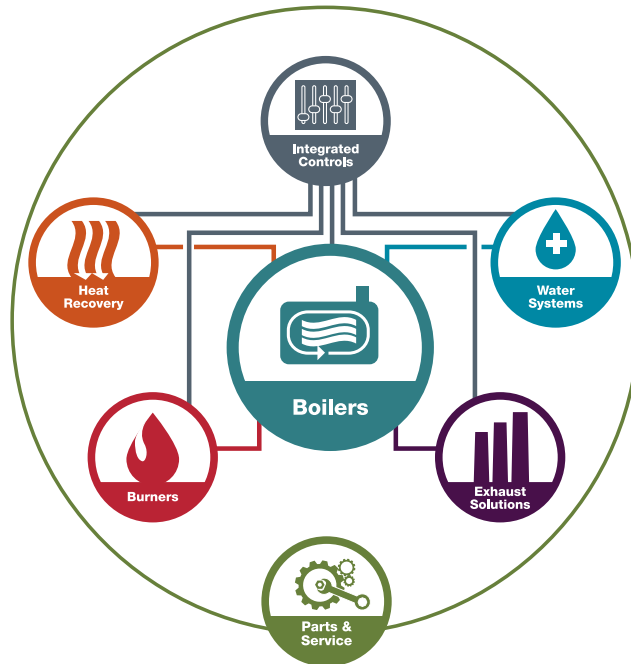
Flash Separators

Model FSS

Cleaver-Brooks FSS Series flash separators help recover valuable BTUs in steam. They instantly separate steam and condensate. Clean steam is returned to a lower pressure, which saves BTUs and make-up water. Flash separators are also smaller in size and more efficient than flash tanks.

Features

- Steam boilers
- ASME code stamp
- Fast ROI



Total Integration goes far beyond water systems.

For more than 80 years, Cleaver-Brooks has built a reputation for innovation in the boiler solutions industry. We remain committed to introducing technology and products that enable a more energy-efficient and environmentally friendly generation of steam and hot water.

When you come to us for a fully integrated solution, you can know that each element is created to the highest standards, and all will work together seamlessly to give you a highly efficient and reliable solution for protecting your boiler system. To learn more, please call or visit us online at cleaverbrooks.com.



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