CleaverBrooks®

FLX

FLEXTUBE

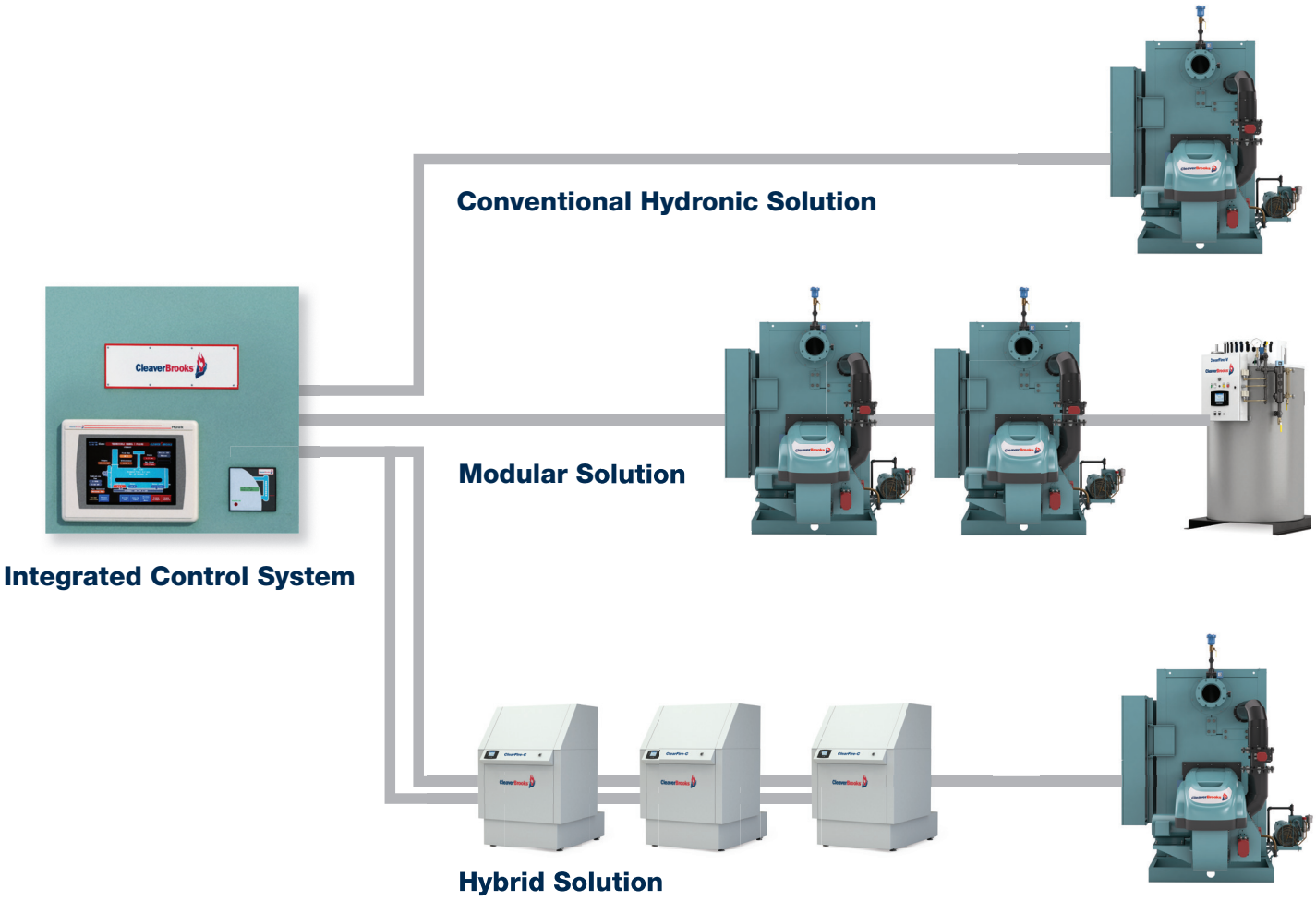
The Widest Range of Hydronic and Steam Watertube Boiler Systems 1,500 to 25,000 MBTU/HR (35-600HP)

Completely Integrated Boiler System Solution

Flexible solutions for any application.

Cleaver-Brooks designs and manufactures every major component of our boiler systems to work together, so your system is always operating at peak efficiency and with the lowest possible emissions. As the demand for more efficient, sustainable steam and hot water systems increases, flexible solutions and combinations of boilers can deliver the best solution.

The Cleaver-Brooks flexible watertube boiler can be paired with other condensing or non-condensing boilers to divide the system load more efficiently, so only the boilers you need to meet system demand will be operating at any given time. Whether a steam, hot water or hybrid solution, we can customize one to best meet the needs of your unique application.



Fastest Online Response and Superior Load Tracking

Compact footprint saves valuable square footage in a boiler room.

Designs for steam or hot water in accordance with ASME Section I for 150 psig steam or ASME Section IV for 15 psig steam or 160 psig hot water. Optional design pressure to 250 psig steam or hot water in accordance with ASME Section I.

Reduced emissions to less than 9 ppm on natural gas firing with #2 oil backup; noise level to less than 85 dBA.

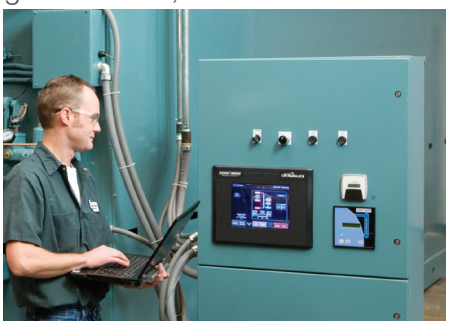
Integrated package with both the pressure vessel design and burner design integrated and manufactured by Cleaver-Brooks; we offer a single source for a performance-proven and -tested package. This system delivers the highest operating efficiency in a complete UL-tested and -certified burner/boiler package for operation on #2 oil, natural gas or propane gas.

Performance-guaranteed efficiency up to 81% on 125 psig steam and 85% on hydronic heating applications. For gas firing, burner turndown up to 10:1 is standard for gas firing with uncontrolled emissions.

Field-erectable for replacement of inefficient boilers that are inaccessible with a factory package, the FLX can be delivered as a field-erectable package (Model FLE) permitting access into limited entryways. This unit can be assembled in the existing boiler room, minimizing demolition of the existing boiler. Assembly of the pressure vessel does not require code welding.

Thermal shock protection, rapid replacement with cool water in a hydronic heating boiler can be detrimental to many boiler designs. But the Flextube® is designed to alleviate these thermal stresses, and as such, the FLX is warranted for 25 years against thermal stress occurrences.

Integrated safety controls provide optimum water level safety monitoring and control, as well as solid state flame safeguard and optional UL-packaged Hawk Control* featuring parallel positioning, VFD and O_2 Trim.



Applications include hydronic heating for universities, colleges, medical facilities, office complexes and airport facilities, and process steam applications such as hospitals, pharmaceuticals, manufacturing and laundry facilities, where quick steam and rapid load tracking are essential.

* Hawk 1000 is standard on units 1250 and larger.

The Latest Boiler Design Technology Delivers Superior Efficiency

The FLX is a fully integrated, tested and certified cUL/UL boiler system that provides superior performance for a rapid return on your investment. The FLX is the apex of engineering-designed and -selected components that are singularly never greater than the total package, which means each contributes to the overall performance of an efficient cost-effective package system. Cleaver-Brooks integration means the boiler, burner and controls are specifically designed to work harmoniously at peak efficiency for each demand response.

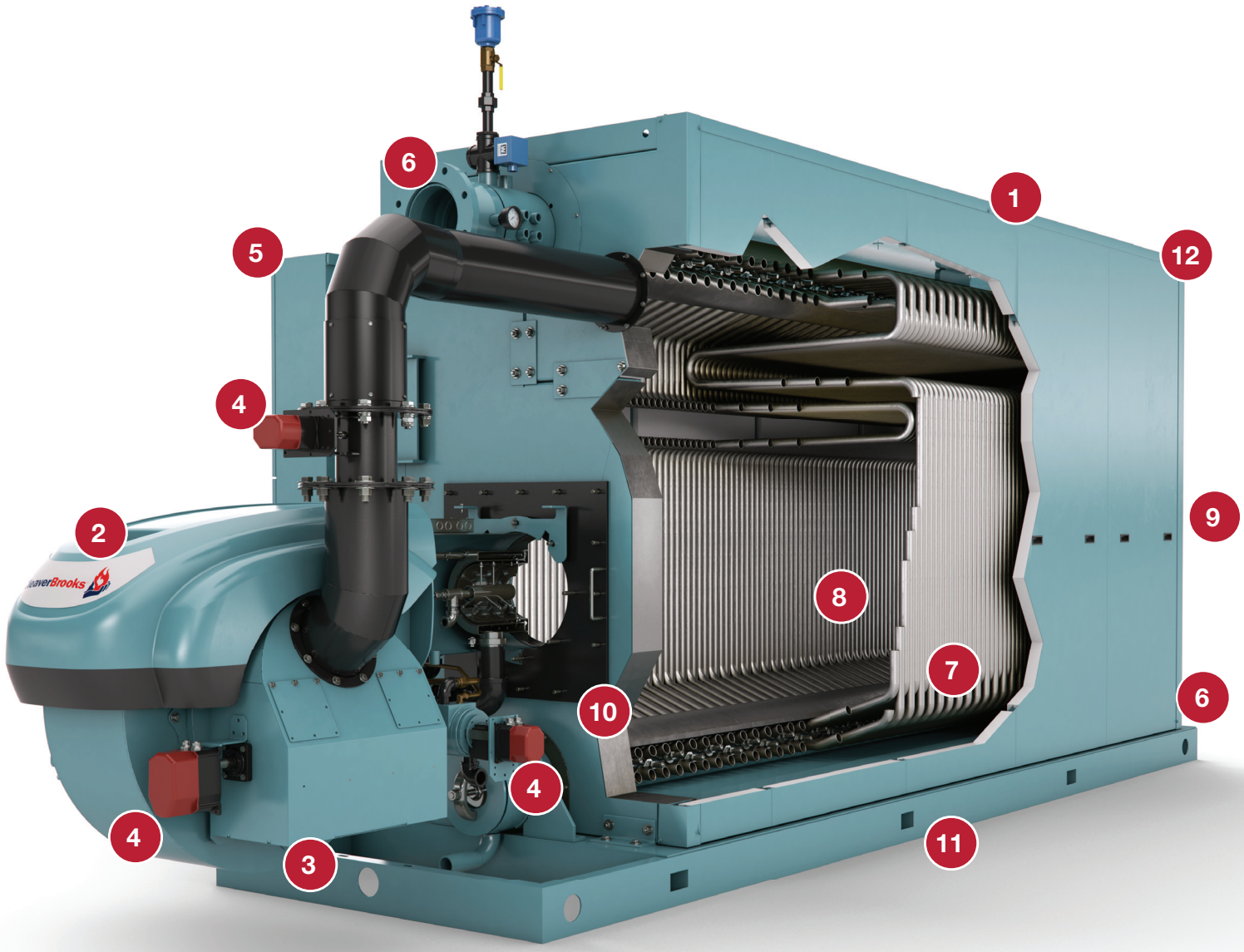
For steam applications, the FLX will provide a guaranteed steam quality of 99.5% for 125 psig or 15 psig. This is accomplished with our engineered drum internals and larger steam-drum on the size 1250 and larger units as standard and optional for our smaller units.

HEAT EXCHANGER

Five pass fireside heat transfer design is the culmination of our focused-design, dynamic analysis using functional engineering to provide optimum thermal efficiency in a smaller footprint than a traditional watertube design. Consisting of multiple tubes, each tube is precisely engineered with a specific bend pattern to provide thermal stress protection and gas flow direction without the addition of baffles or baffle shields. A fully water-cooled furnace ensures optimum heat transfer in a boiler's highest heat transfer zone and also minimizes heat loss through the casing. For easy field assembly or tube removal if needed, each Flextube® is fitted with a special fitting that anchors the tubes to the upper and lower drums, eliminating welding the tubes to the drums. The vessel is encased with an insulted inner jacket and outer jacket to maintain an outer jacket temperature of approximately 120°F or less.

COMBUSTION

Utilizing the Cleaver-Brooks ProFire® Forced Draft Burner, there is no guess work on combustion performance. Each packaged FLX is equipped with a fully tested and certified cUL/UL packaged burner designed to work specifically with the FLX Heat Exchanger. Whether firing natural gas, propane gas or #2 fuel oil, standard operation is demand modulation offering optimum combustion efficiency from minimum firing to maximum firing. For FLX sizes 1250 and greater, linkage control is replaced with parallel positioning control using the Cleaver-Brooks HAWK 1000 Burner Management system. Options for controlled emissions are available to less than 9 PPM NOx on natural gas.



Components

1. Exhaust connection
2. Forced Draft Burner, Gas/Oil
3. Combustion air intake
4. Parallel Positioning Servo Motors — eliminates linkage loss, tighter fuel to air control for maximum combustion efficiency
5. Central Control Panel — hinged to swing away from boiler side to permit access to boiler internals
6. Supply and Return Water Connections, flat face flange
7. Tangent Tube Construction — full water-wall design for maximum heat transfer in the furnace chamber
8. Five-pass gas travel — cross flow for maximum heat transfer efficiency
9. Rear door access to furnace chamber precludes removing burner for furnace access
10. Hinged burner door for easy access to burner internals for inspection and maintenance
11. Rugged base frame with minimum 3" pour refractory floor to minimize heat loss and firm foundation setting
12. Removable side inner and outer access panels to tubes. Inner panels are insulated to provide a cooler outer surface reducing standby losses

MODEL FLE — OPTION

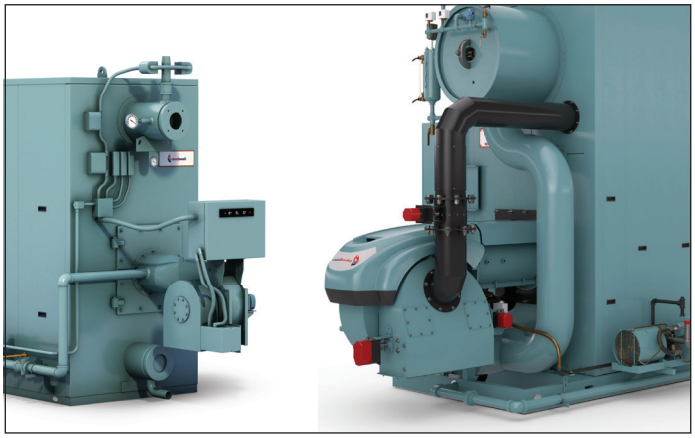
Fully Field Erectable

When access to your boiler room is limited, but you want a factory completed packaged boiler to replace an old, inefficient one, the FLE is the solution. The FLE is factory-packaged after the hydro test of the pressure vessel. Each tube is properly marked to its location to each drum, and the base, front and rear walls, insulated casing, controls and burner are packaged separately in a single shipment for ease of access to the boiler room.

- Isolated downcomers are flanged to reduce clearance requirements and eliminate field welding
- Factory-insulated casing reduces assembly hours
- Front and rear walls are fully insulated eliminating the need for field refractory work
- Boiler base frame is fully insulated
- Burner is factory pre-wired and fuel trains are pre-piped and wired for ease of attachment
- Burner Management Controls are mounted and pre-wired in the burner panel

PACKAGED BURNER V-SERIES and VE-SERIES

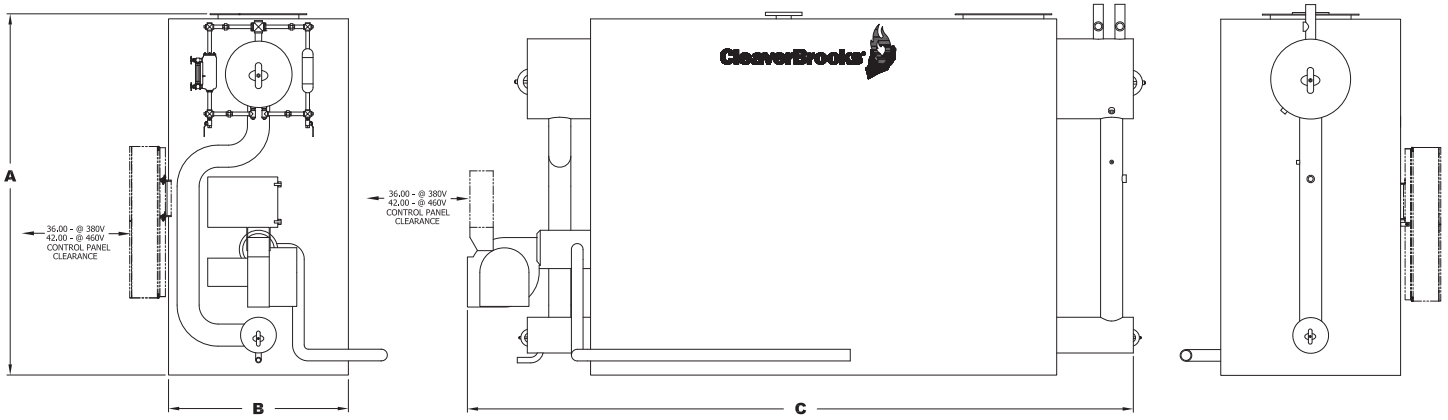
The Ultimate in Performance



ProFire® Burner Offers:

- Low fan motor HP requirements
- Quiet operation
- Efficient low excess air capability (consistent and repeatable across firing range)
- Low CO performance (<100 ppm natural gas corrected to 3% O2)
- Ease of combustion setup with unique air damper
- Low NOx option available to meet the most demanding regulations, <9 PPM
- Up to 10:1 turndown on gas with uncontrolled emissions
- Up to 7:1 turndown on gas with controlled low NOx option

FLX Boiler Dimensions and Weights



STEAM - IMPERIAL UNITS

Model No.	150 - 250	300 - 350	400 - 600	700 - 900	1000 - 1200	1250	1450	1650	1850	2100	2500
A. Boiler Height (inches)	86	90	95	109	109	113	113	121	121	149	149
B. Boiler Width (inches)	42	46	48	54	54	54	54	60	60	75	75
C. Total Length (inches)	108	114	139	168	205	252	267	278.75	297.75	306.75	336.75
Shipping Weight (lbs)	5,700	6,200	7,900	10,200	12,000	16,000	17,300	21,200	22,200	30,500	34,100
Operating Weight (lbs)	6,600	7,200	9,200	12,500	14,100	19,200	20,800	26,300	27,700	38,400	43,100

STEAM - METRIC UNITS

Model No.	150 - 250	300 - 350	400 - 600	700 - 900	1000 - 1200	1250	1450	1650	1850	2100	2500
A. Boiler Height (mm)	2,184	2,286	2,413	2,769	2,769	2,870	2,870	3,073	3,073	3,785	3,785
B. Boiler Width (mm)	1,067	1,186	1,219	1,372	1,372	1,372	1,372	1,524	1,524	1,905	1,905
C. Total Length (mm)	2,743	2,896	3,531	4,267	5,207	6,401	6,782	7,080	7,563	7,791	8,553
Shipping Weight (kg)	2,586	2,812	3,583	4,627	5,443	7,258	7,847	9,616	10,070	13,835	15,468
Operating Weight (kg)	2,994	3,266	4,173	5,670	6,396	8,709	9,435	11,930	12,565	17,418	19,550

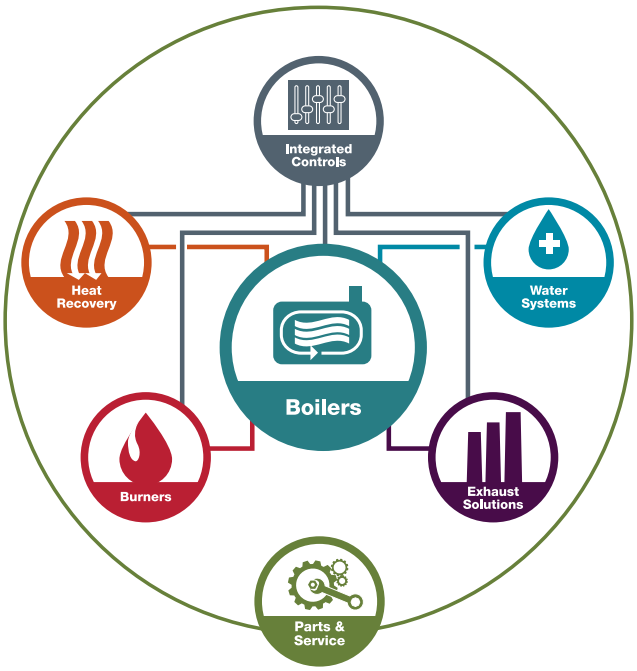
HOT WATER - IMPERIAL UNITS

Model No.	150 - 250	300 - 350	400 - 550	600	700 - 900	1000 - 1200	1250	1450	1650	1850	2100	2500
A. Boiler Height (inches)	78	82	86	86	95	95	95.5	95.5	107	107	131.5	131.5
B. Boiler Width (inches)	42	46	48	48	54	54	54	54	60	60	75	75
C. Total Length (inches)	115	120	146	153	174	206	252.5	267.5	279.25	298.25	311.25	340.25
Shipping Weight (lbs)	3,900	5,000	6,100	6,100	8,500	10,000	12,800	13,800	16,900	17,700	24,300	27,200
Operating Weight (lbs)	4,700	5,900	7,600	7,600	10,500	12,300	15,400	16,600	21,200	22,400	31,00	34,800

HOT WATER - METRIC UNITS

Model No.	150 - 250	300 - 350	400 - 550	600	700 - 900	1000 - 1200	1250	1450	1650	1850	2100	2500
A. Boiler Height (mm)	1,981.2	2,082.8	2,184.4	2,184.4	2,413	2,413	2,426	2,426	2,718	2,718	3,340	3,340
B. Boiler Width (mm)	1,067	1,168	1,219	1,219	1,372	1,372	1,372	1,372	1,524	1,524	1,905	1,905
C. Total Length (mm)	2,321	3,048	3,708	3,886	4,420	5,232	6,414	6,795	7,099	7,756	7,906	8,642
Shipping Weight (kg)	1,769	2,268	2,767	2,767	3,856	4,536	7,258	7,847	9,616	10,070	13,835	15,468
Operating Weight (kg)	2,132	2,676	3,447	3,447	4,763	5,579	8,709	9,435	11,930	12,565	17,418	19,550

Dimensions and specifications are subject to change without notice. Dimensions are for layout purposes only and not for construction. Measurements are in inches.



Total Integration goes far beyond boilers.

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 boiler 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. To learn more, please call or visit us online.

CleaverBrooks®

Packaged Boiler Systems
221 Law Street, Thomasville, GA 31792 USA
800.250.5883 • info@cleaverbrooks.com
cleaverbrooks.com

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