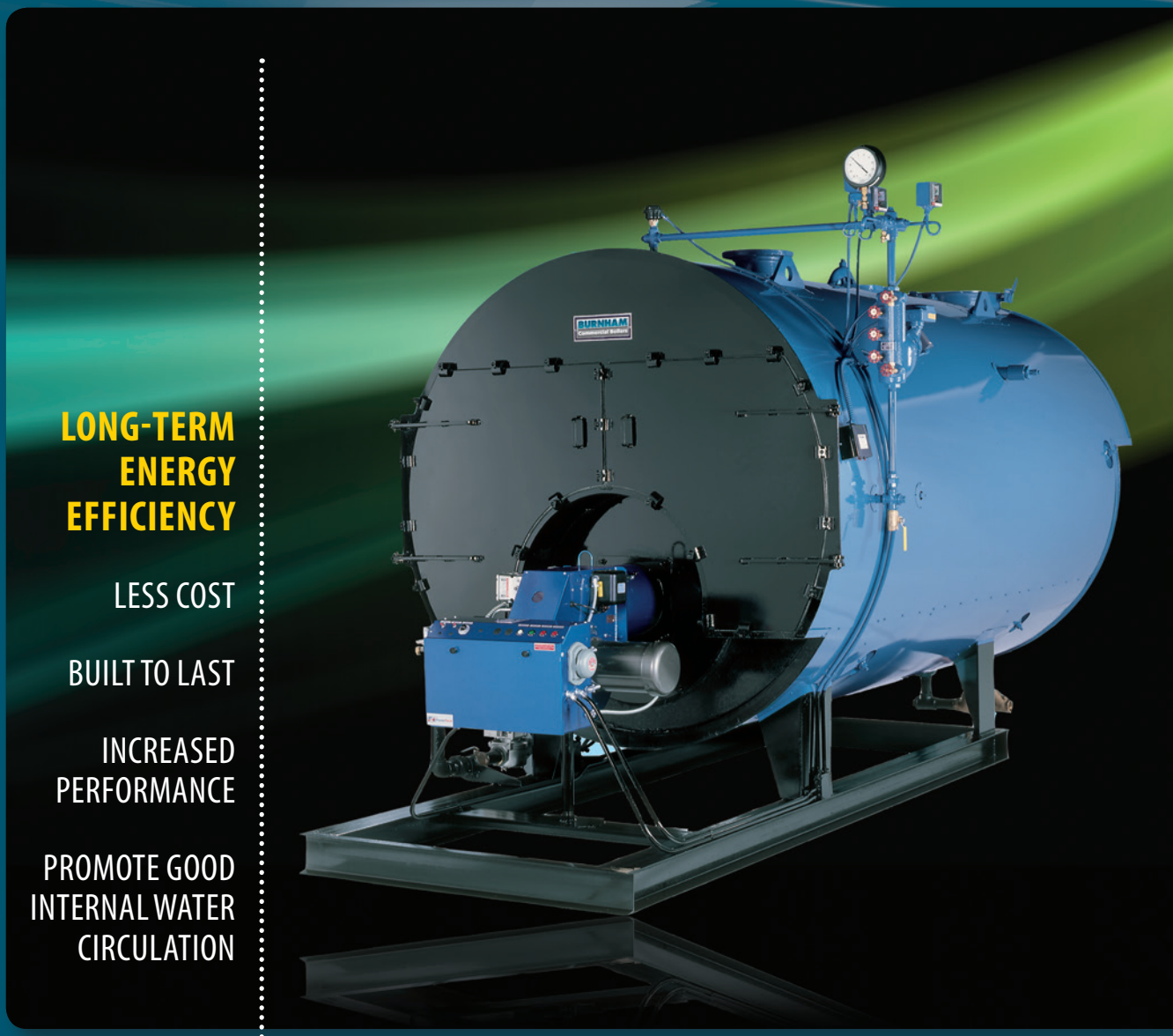
BURNHAM®
Commercial Boilers



LONG-TERM ENERGY EFFICIENCY

LESS COST

BUILT TO LAST

INCREASED PERFORMANCE

PROMOTE GOOD INTERNAL WATER CIRCULATION

Series 3

PACKAGED FIRETUBE BOILER

Series 3 PACKAGED FIRETUBE BOILER

The Burnham Commercial Wetback Advantage

Over the life of a dryback, brittle refractory baffling and rear door gasketing will require continuous monitoring, maintenance and replacement, costing thousands upon thousands of dollars. **These built-in maintenance costs can eventually equal or exceed the original cost of the boiler.** As refractory deteriorates, leaking hot gas causes boiler efficiency to drop until the condition is noticed and the repairs can be made. Expensive flue temperature alarms are offered with some drybacks to monitor this dangerous and costly potentiality. The rear door itself can become heat-distorted, requiring an expensive replacement. In addition, boiler downtime during repairs can mean crippling losses.

This waste of time and money is eliminated with the Burnham Commercial wetback design. The actively functional water jacket eliminates the need for: refractory wall, rear door, rear door inspection and sealing, door swing space and flue temperature alarm. These costly maintenance headaches are gone, while boiler performance is **increased**. Burnham Commercial has only a small, inexpensive refractory area in the burner area, for burner mounting. The rear access door liner is a ceramic fiber insert that contains no refractory.

The furnace and rear turnaround area are cool running, fully wetbacked radiant heat transfer surfaces. They promote good internal water circulation and rapid heat absorption. There is no need for the forced internal circulation pumps often specified to cool the rear tube-sheets and drybacks.

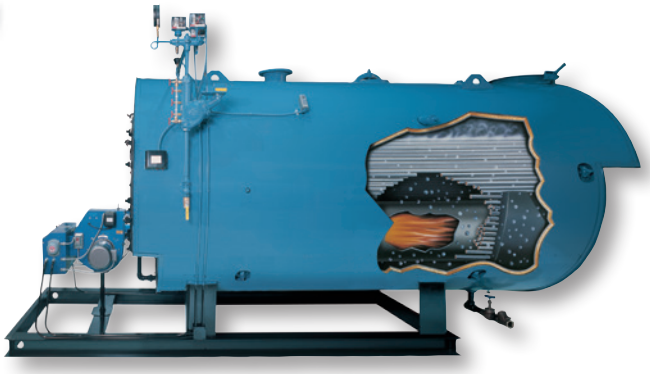
The Burnham Commercial Wetback is Built to Last

Typical dryback boilers have a common rear tubesheet that expands and contracts at different rates adjacent to each tube pass, stressing tube ends and increasing the likelihood of leaks. Additionally, the heavy refractory used in some drybacks reflects intense heat to the rear tube ends and tube sheet, accelerating their deterioration. In attempts to stop leaking, the rear ends of tubes have sometimes been welded. Cleaning or tube replacement involves opening both the front and rear covers and resealing them when the job is done. Usually, if tubes have been welded at the ends, the welds must be burned out, the tube sheet repaired (or a new segment welded in) and the new tubes welded.

These costly expenditures are not an issue with the Burnham Commercial Scotch Marine: separate rear tube sheets from each pass to expand and contract at its own rate without tube-to-sheet stress. Tubes are rolled and flared in low-pressure units; and rolled, flared and beaded in high-pressure units. No welding of tubes is permitted, nor is it necessary. Any eventual tube replacement is simply a mechanical operation, no welding involved. The end result is less cost and less headache.

For more information, drawings or specifications, visit www.burnhamcommercial.com.

FRONT VIEW



SIDE VIEW

REAR VIEW

Series 3 RATINGS AND DATA

Ratings and Data

Model	INPUTS			OUTPUTS					IBR NET RATING			APPROX. WT. DRY, LBS.	
	Gas Input MBH	Oil Input MBH	Oil Input GPH	Water		Steam			Steam MBH	Steam SQ FT	Water MBH	15–30 PSI	150 PSI
				MBH	BHP	MBH	BHP	Lb./Hr.					
3-40	1,674	1,638	11.7	1,374	41.1	1,354	40.5	1,396	1,024	4,267	1,195	3,290	4,200
3-50	2,092	2,030	14.5	1,728	51.6	1,707	51.0	1,760	1,317	5,488	1,503	4,380	4,700
3-60	2,511	2,436	17.4	2,087	62.3	2,064	61.7	2,128	1,603	6,677	1,814	4,840	5,200
3-70	2,929	2,814	20.1	2402	71.7	2,381	71.1	2,455	1,849	7,703	2,089	5,500	6,200
3-80	3,348	3,220	23.0	2,772	82.8	2,759	82.4	2,844	2,142	8,925	2,411	5,900	6,700
3-90	3,766	3,626	25.9	3,152	94.2	3,133	93.6	3,230	2,433	10,136	2,741	6,400	7,200
3-100	4,184	4,046	28.9	3,531	105.5	3,506	104.7	3,614	2,722	11,342	3,071	6,900	7,700
3-125	5,230	4,998	35.7	4,283	128.0	4,257	127.2	4,388	3,305	13,772	3,725	8,700	9,500
3-150	6,277	6,034	43.1	5,241	156.6	5,204	155.4	5,363	4,040	16,834	4,558	9,700	10,600
3-175	7,323	7,042	50.3	6,188	184.9	6,144	183.5	6,333	4,770	19,876	5,381	10,900	11,600
3-200	8,369	8,064	57.6	7,130	213.0	7,080	211.5	7,297	5,497	22,904	6,200	12,300	13,300
3-250	10,461	10,038	71.7	8,714	260.3	8,641	258.1	8,906	6,709	27,953	7,577	15,400	18,600
3-300	12,553	12,082	86.3	10,607	316.9	10,532	314.6	10,855	8,177	34,071	9,224	18,100	21,400
3-350	14,645	14,014	100.1	12,155	363.1	12,053	360.1	12,422	9,358	38,991	10,570	21,000	23,700
3-400	16,738	16,072	114.8	14,060	420.0	13,943	416.5	14,370	10,825	45,105	12,226	23,200	26,200
3-500	20,922	20,062	143.3	17,554	524.4	17,407	520.0	17,940	13,515	56,312	15,264	27,400	30,600
3-600	25,106	24,164	172.6	21,340	637.5	21,164	632.2	21,813	16,432	68,466	18,557	31,500	35,500
3-700	29,291	28,238	201.7	25,102	749.9	24,897	743.8	25,660	19,330	80,543	21,828	35,700	39,700

NOTE: Dimensions and Data are not for construction purposes and are subject to change without notice

- Large, fully waterbacked furnace tube assures complete combustion and heat absorption without flame impingement.
- Three gas passes extract maximum usable heat from the fuel while maintaining optimum flow for forced draft firing.
- Fully waterbacked reversing chamber effectively absorbs radiant heat into the water, keeping tube ends and rear of boiler cooler than those of hot-running drybacks.
- Ready access to tubes through rugged front door and rear covers makes routine cleaning easier and less costly than with drybacks.
- Burner does not have to be disturbed.
- No inner air baffle door to contend with.
- No delicate expensive baffle tiles or door seals to replace.
- Unlike dryback boilers, securing the doors on a Burnham Commercial wetback boiler requires no specialized skills or expensive repair materials. It is a simple process which can be done with in-house personnel and performed with minimal downtime.

Efficiencies

Ratings and Data

Model	GAS EFFICIENCIES				OIL EFFICIENCIES			
	Water		Steam		Water		Steam	
	Combustion Efficiency %	Thermal Efficiency %	Combustion Efficiency %	Thermal Efficiency %	Combustion Efficiency %	Thermal Efficiency %	Combustion Efficiency %	Thermal Efficiency %
3-40	82.1	82.1	81.8	80.9	85.1	83.8	84.7	83.3
3-50	83.0	82.6	82.5	81.6	85.9	84.9	85.5	84.1
3-60	83.8	83.1	83.2	82.2	86.6	85.9	86.3	85.0
3-70	83.1	82.0	82.5	81.3	86.4	85.4	85.0	83.8
3-80	83.8	82.8	83.4	82.4	87.0	86.1	85.7	84.7
3-90	84.5	83.7	84.1	83.2	87.6	86.9	86.5	85.6
3-100	85.1	84.4	84.6	83.8	88.1	87.4	87.1	86.3
3-125	82.9	81.9	82.5	81.4	86.7	85.7	85.3	84.2
3-150	84.2	83.5	83.7	82.9	87.6	86.9	86.5	85.6
3-175	85.1	84.5	84.6	83.9	88.4	87.8	87.3	86.6
3-200	85.8	85.2	85.2	84.6	88.9	88.4	88.0	87.4
3-250	83.9	83.3	83.3	82.6	87.3	86.8	86.1	85.4
3-300	85.0	84.5	84.4	83.9	88.3	87.8	87.1	86.6
3-350	83.6	83.0	83.0	82.3	87.3	86.7	86.0	85.3
3-400	84.5	84.0	83.9	83.3	88.0	87.5	86.8	86.2
3-500	84.4	83.9	83.8	83.2	88.0	87.5	86.8	86.3
3-600	85.4	85.0	84.8	84.3	88.7	88.3	87.7	87.2
3-700	86.1	85.7	85.4	85.0	89.3	88.9	88.3	87.9

NOTE: Dimensions and Data are not for construction purposes and are subject to change without notice

Thermal Efficiency

The effectiveness of the boiler as a heat exchanger. It is the ability of the boiler to exchange heat through tubes and furnace, by radiation, conduction and convection, to the transfer medium (water). A few of the factors affecting thermal efficiency are heating surface, tube number and diameter, furnace tube length and diameter.

Combustion Efficiency

This is a measure of the ability of the burner to effectively and completely burn the fuel, coupled with the thermal efficiency of the boiler. Burners requiring high amounts of excess air to provide flame stability will be less efficient. Combustion efficiency does not take into account heat loss to the surrounding air through the boiler jacket and piping.

Fuel-to-Steam Efficiency

Sometimes referred to as overall efficiency. This is a ratio of heat output to heat input. This includes boiler jacket and piping losses to the surrounding environment. It is the percent of usable heat in the steam (or hot water) compared to the heat input supplied by the burner. It is also defined as the combustion efficiency less boiler jacket and piping loss (radiation and convection losses). Since fuel-to-steam efficiency reflects the portion of actual usable heat supplied to the system, it is most useful when comparing performance of similar equipment, or when doing fuel savings analysis.

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