BURNHAM COMMERCIAL
AMERICA'S BOILER COMPANY®

Series 3
Packaged Firetube Boiler

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Save Thousands Of Dollars Over The Life Of Your Boiler

Long-term energy and maintenance efficiencies are the focus of Burnham quality engineering. When choosing a boiler, it's a good idea to select a product with these features in order to reduce enormous hidden costs down the road. Review our wetback versus dryback literature for cost savings.

Boiler Costs Is Not Jus A First Year Proposition

With any ordinary boiler, expenses such as fuel, maintenance, and repair costs can escalate as the years go on. Burnham packaged boilers are designed to diminish these significant expenditures.

Burnham's High Life-Cycle Efficiency

While most competitive boilers can give fuel-to-steam efficiencies of 80% or over—when they're new—how consistently can they be expected to maintain this level of operation? Burnham wetback boiler performance will not drop due to deteriorating rear refractory, leaking door baffles and seals, and heat-stressed rear tube sheet as can happen with some drybacks. Easy access is a necessity for those with heavy refractory, since they need frequent and expert maintenance.

The Burnham Wetback Saves Big Money On Maintenance

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 Wetback. 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 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.

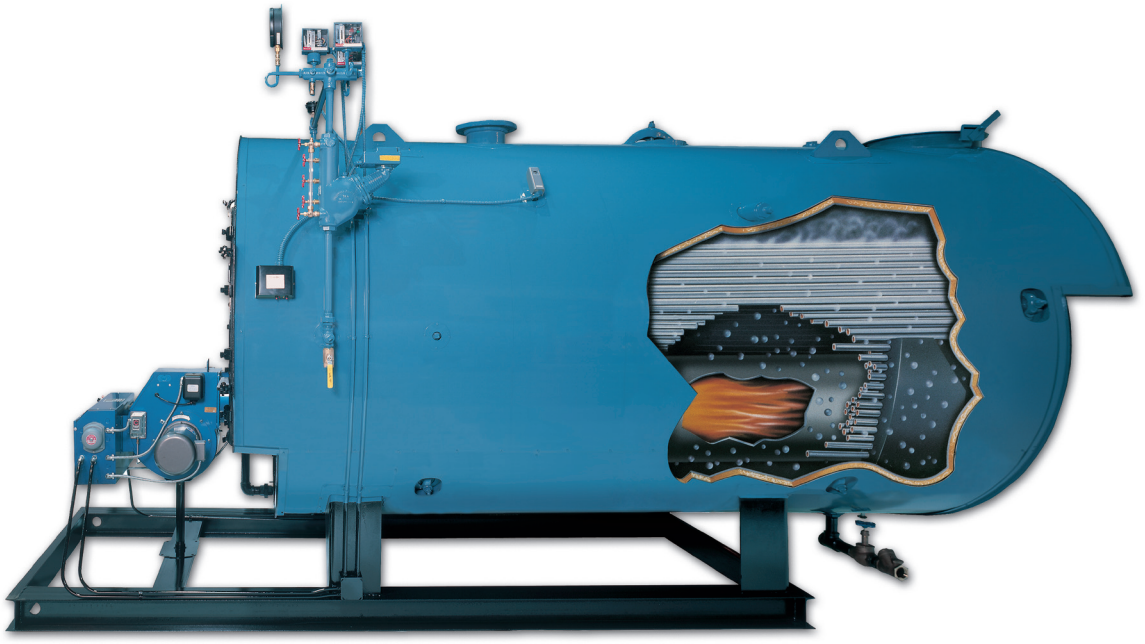
The furnace and rear turnaround area are cool running, fully wetbacked radiant heat transfer surfaces. They promote good internal water circulation and rapid heat absorption. There is no need for the forced internal circulation pumps often specified to cool the rear tube-sheets and drybacks.

The Burnham 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 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.

" America's Boiler



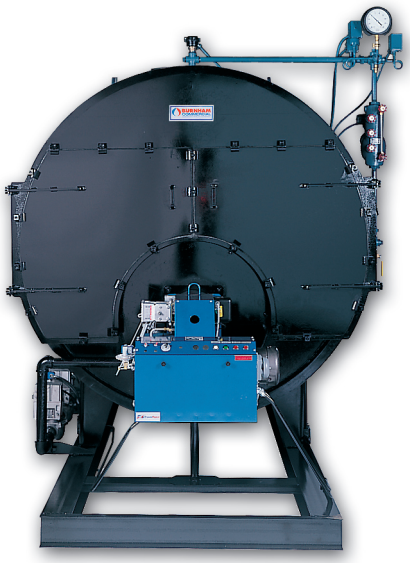
- Large, fully waterbacked furnace tube assures complete combustion and heat absorption without flame impingement.
- Three gas passes extract maximum usable heat from the fuel while maintaining optimum flow for forced draft firing.
- Fully waterbacked reversing chamber effectively absorbs radiant heat into the water, keeping tube ends and rear of boiler cooler than those of hot-running drybacks.

Ratings and Data

Boiler Model No. 3	40	50	60	70	80	90	100	125	150
Shell Diameter	48	48	48	54	54	54	54	66	66
Gross Output, BHP	40	50	60	70	80	90	100	125	150
Gross Output, MBH	1,339	1,674	2,009	2,343	2,678	3,013	3,348	4,184	5,021
Gross Output, LBS/HR	1,380	1,725	2,070	2,415	2,760	3,105	3,450	4,313	5,175
Net Rating - Steam, MBH	1,011	1,290	1,560	1,819	2,079	2,339	2,599	3,248	3,898
Net Rating - Steam, SQ. FT	4,211	5,376	6,499	7,580	8,663	9,747	10,830	13,535	16,243
Net Rating - Water, MBH	1,164	1,456	1,747	2,037	2,329	2,620	2,911	3,638	4,366
Heating Surface SQ. FT. F.S.	200	250	300	350	400	450	500	625	750
SQ. FT. W.S.	220	280	335	390	445	500	555	695	835
Firing Rate - Gas, MBH	1,674	2,093	2,500	2,930	3,348	3,766	4,185	5,230	6,276
Firing Rate - Oil, GPH (140 MBTU/Gal.:150 MBTU/Gal.)	12/11	15/14	18/17	21/20	24/23	27/25	30/28	38/35	45/42
Furnace Vol., CU. FT.	14.8	17.1	19.3	27.8	30.2	33.0	35.8	41.9	47.7
Water Content - LBS. Steam	1,760	2,303	2,765	3,285	3,672	4,060	4,523	5,585	6,660
LBS. Water	2,185	2,701	3,235	4,160	4,641	5,143	5,711	6,673	7,947
Approx. Wt. - Dry, LBS. (15-30 PSI)	3,700	4,200	4,700	5,500	5,900	6,400	6,900	8,700	9,700
(150 PSI)	4,200	4,700	5,200	6,200	6,700	7,200	7,700	9,500	10,600

Note: *Dimensions and Data are Not for Construction Purposes and are Subject to Change without Notice*

Company® "



Front View

- 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 distrubed.
- No inner air baffle door to contend with.
- No delicate expensive baffle tiles or door seals to replace.

Rear View

- After the doors have been opened on the Burnham wetback boiler, there are no specialized skills or expensive repair materals needed to reclose them as with drybacks. Simply tightening the closure bolts reseals the doors. Cleaning can be done inexpensively and the boiler can be put back on the line quickly by your in-house personnel.

175	200	250	300	350	400	500	600	700	800	900	1000
66	66	78	78	90	90	102	102	102	108	114	144
175	200	250	300	350	400	500	600	700	800	900	1,000
5,858	6,695	8,369	10,043	11,716	13,390	16,738	30,085	23,433	26,780	30,128	33,476
6,040	6,900	8,625	10,350	12,075	13,800	17,250	20,700	24,150	27,600	33,217	34,500
4,548	5,198	6,498	7,797	9,096	10,396	12,995	15,594	18,193	20,792	23,500	25,990
18,950	21,658	27,074	32,489	37,901	43,317	54,147	64,957	75,805	86,633	97,615	108,294
5,094	5,822	7,277	8,733	10,188	11,643	14,555	17,465	20,377	23,287	N/A	N/A
875	1,000	1,250	1,500	1,750	2,000	2,500	3,000	3,500	4,000	4,500	5,000
970	1,110	1,360	1,630	1,900	2,175	2,715	3,260	3,805	4,349	4,905	5,430
7,333	8,369	10,461	12,500	14,645	16,738	20,923	25,106	29,319	33,475	37,660	41,846
52/49	60/56	75/70	90/84	105/98	120/112	150/140	180/168	210/196	240/224	269/252	300/280
53.1	58.8	86.6	99.1	113.5	124.7	152.0	174.3	195.8	302.3	278	309
7,758	8,829	11,174	12,315	15,392	16,765	18,515	22,128	25,767	33,945	40,893	45,437
9,245	10,519	13,983	16,649	19,340	22,125	23,788	28,381	33,005	43,762	N/A	N/A
10,900	12,300	15,400	18,100	21,000	23,200	27,400	31,500	35,700	43,900	47,800	51,600
11,600	13,300	18,600	21,400	23,700	26,100	30,600	35,500	39,700	52,900	56,600	102,200

It All Adds Up To Significant Cost-Performance Advantage.

What do all these features and specifications mean? More savings for you! Our Packaged Wetback Firetube boilers are designed for long-term efficiency and economical operation, making Burnham your cost-performance leader!

The Series 3 matches burner to boiler, providing a fuel-efficient, low-maintenance package. Maintenance costs can be further controlled in your boiler room with optional accessories. Such options include state-of-the-art annunciator systems, custom-designed to monitor all boiler and burner interlocks vital to your specific installation. They provide instant readouts of both normal and abnormal operating conditions. These features will pinpoint the cause of unscheduled shutdowns; reducing maintenance time and skill required.

- Forced-draft firing with oil (No. 2, 4, 5, or 6), gas or combination gas/oil
- Low or high pressure steam or water
- Highly efficient three-pass design
- Fully waterbacked primary heating surfaces
- Separate rear tube sheets for longer service life
- Wetback design allows easy front and rear access
- No expensive refractory or door replacement as with some drybacks.

Series 3 — Standard Equipment

Boiler:

Three pass full wetback, packaged firetube type, constructed in accordance with requirements of the ASME Code Section IV for 30 psi and 125 psi water or 15 psi steam; Section I for higher pressure steam. All units are registered with the National Board.

Boiler tubes are expanded and flared in low pressure boilers; expanded and beaded in high pressure boilers. Turbulator baffles are not used in tubes. Separate second and third pass rear tube sheets allow safe expansion and contraction.

Waterbacked rear turnaround promotes rapid internal circulation and reduces gas temperatures at entrance to second pass, reducing tube end stress.

Easy opening hinged, insulated front flue doors with lightweight closure provide full access to all tubes. A 16-inch diameter bolted rear access door with observation port provides access to the boiler furnace. Rear tube access is provided by removing light weight gasketed door(s) installed in the rear smokebox. No elaborate seals are used.

A manhole is furnished as standard on water and low pressure steam boilers sizes 3-125 and larger; on high pressure steam boilers sizes 3-70 and larger.

Handhole washouts are provided for easy inspection and cleaning of waterside surfaces.

All steam boilers provided with a dry pan to ensure dry steam. A feedwater diffuser is provided on high pressure boilers. All water boilers are equipped with a dip tube at supply outlet and diffuser at return inlet.

The round flanged vertical smoke outlet is equipped with a locking quadrant damper. All boilers are provided with an enameled steel jacket over 2 inches of fiberglass insulation, and lifting lugs.

The boiler is mounted on a heavy duty structural steel base with extended skid and burner platform for protection of the burner during shipment and rigging.

Standard Trim and Controls:

Steam: 157 pump control/low water cut-off with alarm contacts–piped with quick opening blowoff valve. Gauge glass set with hand-operated and try cocks. Steam pressure gauge—4 1/2 inch dial on sizes 100 hp and smaller, 6 inch dial on larger sizes. L404C manual reset high limit pressuretrol and appropriate firing rate control when required. Manual reset probe auxiliary low water cut-off.

ASME side outlet safety valve(s).

Water: 63M manual reset low water cut-off with 30 psi units, 150 low water cut-off with higher pressure units–piped with quick opening blowoff valve. Combination pressure/temperature gauge–3 1/2 inch dial on 100 hp and smaller. On larger sizes a 6 inch combination pressure/altitude gauge and 5 inch dial temperature gauge. L4006A operating aquastat and L4006E manual reset high limit aquastat and appropriate firing rate control when required.

ASME side outlet safety valve(s).

Burner Equipment:

Burner mounts to front head of boiler with no elaborate seals.

Factory packaged units available with forced draft burners for all commonly used fuels–gas, all grades of oil–No. 2 through No. 6–and combination gas/oil. Choice of pressure or air atomizing burners for No. 2 oil–air atomizing on heavy oil. Gas burners are available for either natural or LP gas.

Refer to burner data sheets for standard burner equipment and operating sequence.

Accessories and Optional Equipment:

Accessories and optional equipment available at extra cost, including, but not limited to:

- Solid-state annunciators
- Alternate or additional water level controls or low water cut-offs
- Built-in tankless heater coils—low-pressure boilers only
- Motorized or pneumatic feed valves
- Surface skimmers and blowoff valves
- Bottom blowdown valves and drain valves
- Feed stop and check valves
- Sequence draft controls
- Lead/lag sequencing systems
- Boiler Feed systems
- Low NOx burners
- Deaerators
- Water Softeners
- Chemical Feed systems
- Blowdown systems
- Sample Coolers

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