WEBSTER COMBUSTION

A Selas Heat Technology Company

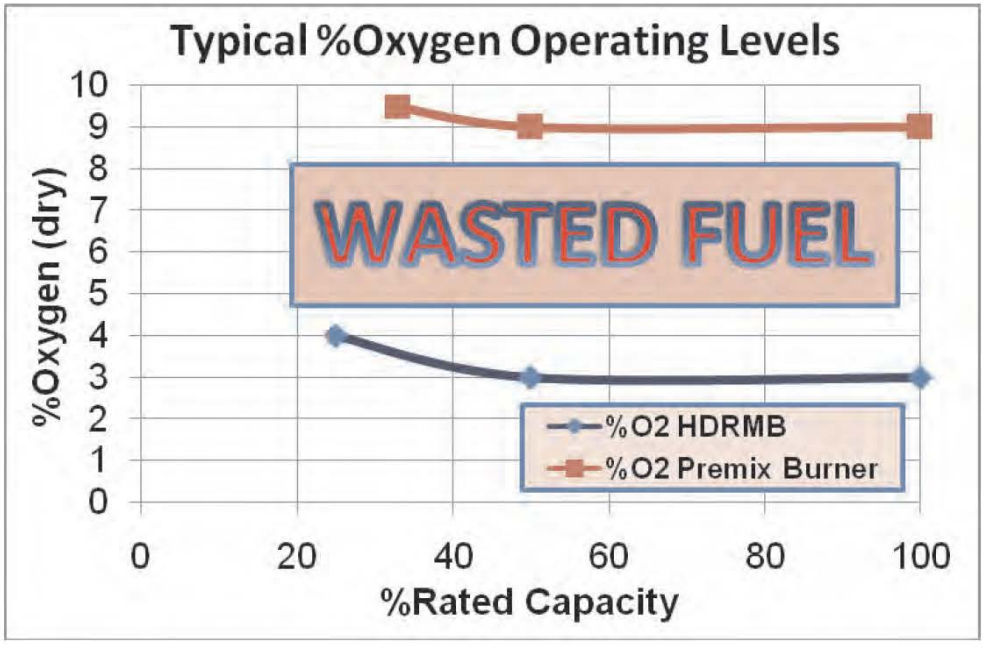
For Ultra Low NOx Choose Efficiency - Choose *WEBSTER!*

When selecting an ultra low NOx burner, be sure to take efficiency into account. Compared to high excess air, pre-mix style burners, the Webster model HDRMB™ burner utilizing the patented* rapid mix burner technology, is a much more efficient choice for your 9ppm NOx applications. The inherently low excess air design of the HDRMB, combined with the *TEMP A TRIM*® air density trim system (standard equipment on the HDRMB) provides real fuel and electrical savings, reduced maintenance costs, higher boiler efficiency, and lower emissions.

Webster Model HDRMB™ Ultra Low NOx Burner

All burners require a certain amount of excess air in order to insure safe operating conditions. However, because all the air that goes into the boiler must be heated, the less excess air that can be used the more efficient your boiler will operate. High excess air, pre-mix style ultra low NOx burners typically operate with an O_2 level of approximately 9.0%, which equates to approximately 68% excess air volume. If that sounds like a lot of excess air, it is! Heating all this excess air requires more fuel, and more fuel means a higher operating cost.

In comparison, the Webster model HDRMB ultra low NOx design typically operates at O_2 levels of under 4.0%, or approximately 20% excess air. This graph illustrates the typical O_2 operating levels of the HDRMB compared to a typical pre-mix burner. So if you're using a premix style burner, you're wasting a lot of fuel!



*U.S. Patent Numbers 5,407,347 and 5,470,224

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Ultra Low NOx – Make an EFFICIENT Choice

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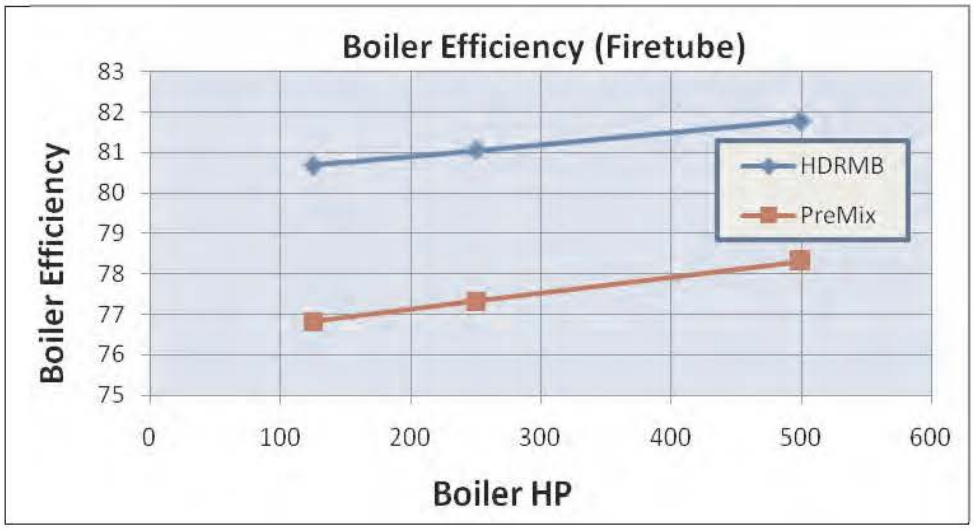
The high excess air rates on a typical pre-mix burner result in lower boiler efficiency, as shown on the graph. This lower efficiency means that you have to use more fuel (higher fuel costs) to generate the same steam or hot water flow. It also means that even though the emission level is the same, the total emissions, like the total fuel usage, is higher with the premix burner.



The integral *TEMP A TRIM* control system on the HDRMB uses a temperature sensor and a Variable Frequency Drive (VFD) to maintain consistently low excess air levels as the air coming into your boiler room changes with temperature. In addition, the *TEMP A TRIM* system provides up to 32% electrical savings and a possible rebate from your utility company. The table below shows typical savings in fuel, electricity, and emissions for operating boilers with the HDRMB as opposed to using a premix style burner. The HDRMB provides a faster payback and lower total emissions. Contact your Webster Representative for more details on how the HDRMB is a better burner for your application.

Premix Style Burner vs. HDRMB - Comparison

Boiler Size	Premix Burner			HDRMB Burner			SAVINGS With HDRMB				
	O_2	Excess Air	Efficiency	O_2	Excess Air	Efficiency	% Fuel Savings	Fuel $ Saved/yr	Electricity $ Saved/yr	Total $ Saved/yr	Emissions saved/yr (lbs)
5,000 MBH Flextube	9%	68%	76%	3%	15%	81%	6.4%	$13,485	$855	$14,340	5,240
10,000 MBH Flextube	9%	68%	76%	3%	15%	81%	6.2%	$26,041	$1,282	$27,323	10,130
20,000 MBH Flextube	9%	68%	77%	3%	15%	82%	5.8%	$48,527	$2,565	$51,092	18,870
125 HP Firetube	9%	68%	77%	4%	20%	81%	4.8%	$10,255	$855	$11,110	3,990
250 HP Firetube	9%	68%	77%	4%	20%	81%	4.6%	$19,605	$1,282	$20,887	7,620
500HP Firetube	9%	68%	78%	4%	20%	82%	4.2%	$35,702	$2,565	$38,267	13,890

Assumptions

1. Savings are based on firing natural gas, operating at high fire for 4380 hours/yr (50% of time)
2. The burners are assumed to operate at a constant excess air level all of the time (requires controls)
3. Stack temperatures are based on high pressure steam applications
4. Emissions rates are based on guaranteed levels, 8760 hrs for NOx, CO, VOC & CO2
5. Burner inputs for each size and type are based on developing the same boiler output energy
6. Fuel cost is $.9/therm

TEMP A TRIM

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HDRMB Efficiency
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