



**Waterloo
Manufacturing**
Company Limited

Boiler News

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Low Emissions and High Efficiency; A Dichotomy?

Through empirical engineering practices it has been observed and proven that simply applying any burner to a boiler does not result in the most energy efficient unit and certainly not one which will be emitting low amounts of nitrous oxides (NOx) and other pollutants. On the contrary, facing the challenge of the 21st century to generate steam or hot water with high fuel efficiency, and low or ultra-low NOx emissions to reduce smog in the air, requires advanced engineering practices using sophisticated technical and

modeling tools. Burner design can no longer be made independently of the furnace to which it is installed. It must integrate the furnace effects and provide a means of adapting combustion aerodynamics to match the furnace's geometry. This trend is therefore leading to a total integration of the boiler, burner and controls; forming a compact, energy efficient and low emitting steam/hot water package.

Today, the leaders in the boiler industry are following a technological path similar to that of

the gas turbine industry; using computational fluid dynamics (CFD) principles to shape the best, most efficient design result.

Likened to the gas turbine, the modern boiler furnace design, with its constraints of volumetric heat generation, requires a high level of temperature uniformity obtained by fast and efficient mixing of the fuel and air to achieve extremely low NOx emissions.

In the final analysis, it is the mixing power of the properly designed burner working in conjunction with the existing or properly designed furnace which results in natural gas NOx emission levels ranging anywhere from 60 to < 9PPM without reducing the boiler's overall fuel to steam or water efficiency.

To read the full report, go to
www.environmental-resource.com/cleaver.asp



Cleaver Brooks designs and builds a complete line of commercial and industrial boilers, burners, accessories and control systems for supplying steam and hot water for various applications involving process and comfort heating; New or retrofit for high efficiency and low emissions. With over 100 Representative offices throughout the world, the company provides engineering assistance, training programs, sales, and service/parts on a 24/7 basis.

UPDATE

Our service technicians have undergone the required process and Waterloo Manufacturing is now designated as a

QUALITY ACCESSED CONTRACTOR

by

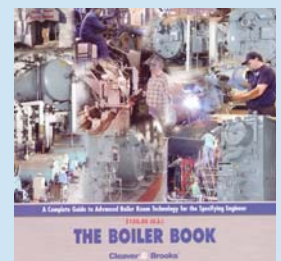


COMMERCIAL / INDUSTRIAL

Engineers

**If you haven't already –
Please use us for the following services:**

- **Complimentary Cleaver-Brooks Boiler Book**
– Providing product information and sample specifications (available on CD or hard copy)



- **Lunch and Learn seminars**
– we bring the food, the drinks and the information - you just provide the room and an hour of your time



STACKS



Not only are we a supplier of boilers and accessories but we also are able to supply and install the necessary stacks for both new and retrofit venting system situations.

ANNUAL SERVICE

For our Customers — please note we have enclosed our annual service application with the newsletter.

If there are specific dates (i.e. Factory shutdown) that you require service performed this year — we recommend you complete and return the form early to ensure your desired dates.

For further information on products and services used in this newsletter
please contact us at:

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