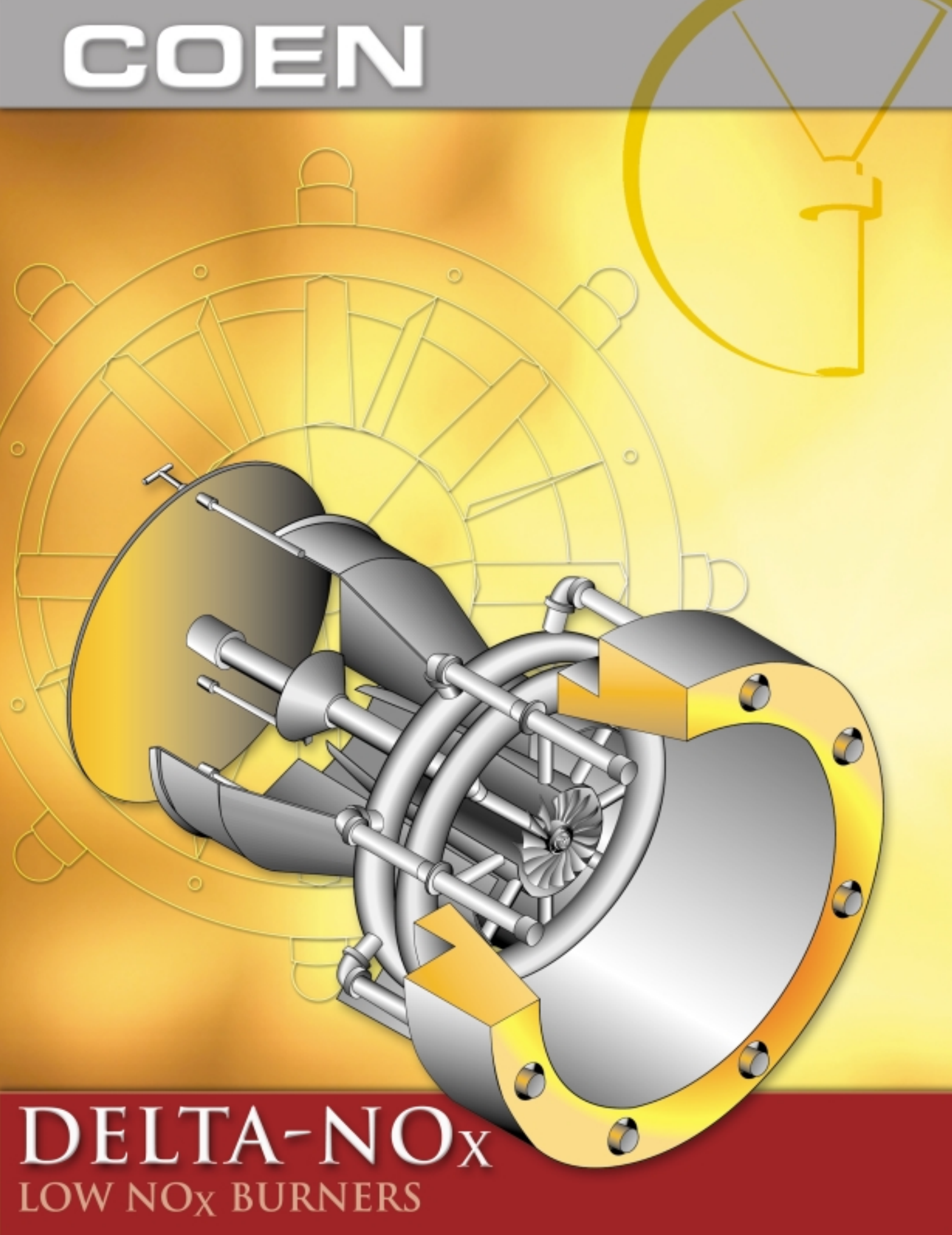
COEN

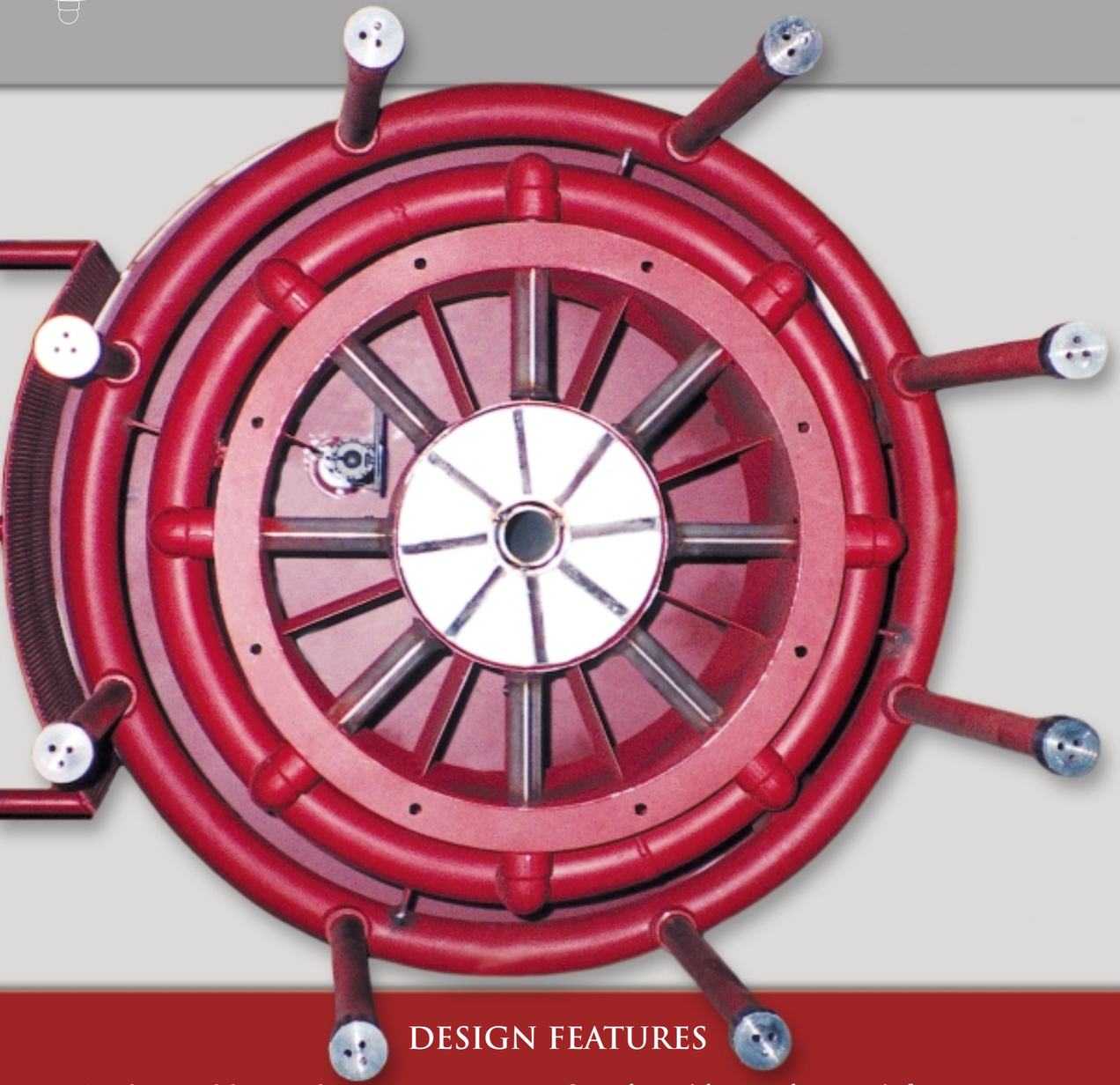


DELTA-NOx

LOW NOx BURNERS

DELTA-NO_X – THE ENERGY EFFICIENT, LOW NO_X SOLUTION

COEN
Clean combustion. Powerful results.



When you need a simple and reliable low NO_X burner designed to optimize system efficiency and emissions performance, you are ready for COEN's Delta-NO_X burner. Our industry-leading engineers crafted this simple yet rugged burner to have no moving parts, allowing its venturi shape to provide uniform air distribution while lowering the airside pressure drop. The resulting decrease in fan horsepower is just the beginning of this low cost, low NO_X solution.

COEN's Delta-NO_X burner achieves between 0.06 and 0.1 lbs/mmBtu NOx, firing natural gas without the maintenance and expense of flue gas recirculation (FGR). Additionally, lower NO_X emissions are easily achieved with minimal FGR. Maximum system efficiency can be achieved by packaging the Delta-NO_X with COEN's Fyr-Monitor Combustion Control System and a variable speed drive on the forced-draft fan. The Delta-NO_X is specifically designed to complement today's compact boiler designs.

Destined to be the standard for industrial watertube boiler applications, COEN's Delta-NO_X solution delivers high-efficiency, low NO_X performance with low installed costs. COEN engineers questioned every detail of the Delta-NO_X design. The result – a low NO_X burner like no other in the industry.

OPTIMUM PERFORMANCE

- Low NO_X: 0.06 to 0.1 lbs/mmBtu/hr (50 ppm to 83 ppm) on gas without FGR
- Lower NO_X emissions easily achieved with minimal FGR
- Low NO_X capability with oil firing
- Capacity range: 20 to 380 mmBtu/hr
- Compact flame with no harmful impingement
- Low VOC, CO and particulate emissions
- Low excess air and low airside pressure drop
- Wide range of gaseous and liquid fuels
- Designed for safe operation with simple controls
- Increased stability and turndown

DESIGN FEATURES

- Simple, rugged design with no moving parts
- Venturi style burner to provide superior air distribution with reduced pressure drop
- Unique "Delta-Spud" radial gas injectors to reduce prompt and thermal NO_X
- Secondary axial gas spuds to entrain furnace gases to further reduce NO_X
- "Isothermal-Shield" for increased stability
- Optional auxiliary oil atomizer
- Optional removable spuds for firing refinery gases

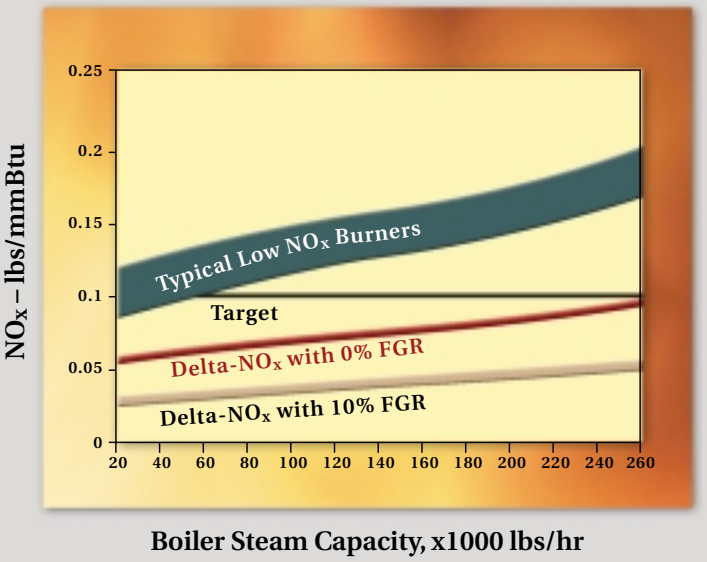
THE BENEFITS OF COEN'S DELTA-NO_X BURNER

- Easy installation and start-up
- Lower operating costs:
  - *Energy efficient*
  - *Low fan horsepower*
  - *Low maintenance*
- Safe and reliable operation

MEETING THE COMPETITION HEAD-ON

With its lower NO_X performance, lower energy consumption, higher turndown and a simpler design than conventional burners, COEN's Delta-NO_X burner challenges the competition in setting the new packaged boiler standard.

DELTA-NO_X BURNER PERFORMANCE



COEN CLIENTS ACHIEVE GREAT RESULTS WITH THE DELTA-NO_X BURNER

APPLICATION

A large hazardous waste incineration facility required a new, efficient replacement burner for its package watertube boiler. The boiler had an existing burner with limited fan capacity and CO emissions over 400 ppm. Lowering CO would increase boiler efficiency. Plus, future NO_X regulations needed to be met without the use of expensive flue gas recirculation (FGR).

COEN replaced the existing burner with a new Delta-NO_X burner to meet these requirements, reusing the existing fan, windbox and damper to reduce the retrofit cost. COEN also supplied the throat assembly, control valve, turnkey installation and start-up services.

RESULTS

The start-up results were even better than expected:

LOW NO_X - NO_X averaged 0.066 lbs/mmBtu over a ten-to-one turndown (60% NO_X reduction).

LOW CO - CO averaged 0.033 lbs/mmBtu over load range and an 85% CO reduction.

STEAM CAPACITY - The low draft loss of the Delta-NO_X resulted in a 20% increase in steam capacity with the existing air fan.

LOW OPERATING COST - Fan operating horsepower is 10% less even with a 20% increase in capacity. Also, the high operating costs associated with FGR are eliminated.

START-UP - The new Delta-NO_X was tuned and set for automatic operation in one day.

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Clean combustion. Powerful results.
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Visit our website at www.coen.com for more information