



## The Brand You Know for Clean, Economical Combustion

As the global leader in advanced combustion technology, John Zink Company combines its world-renowned engineering resources and unparalleled advantages with the number one brand for advanced low-NOx boiler burners – TODD®.

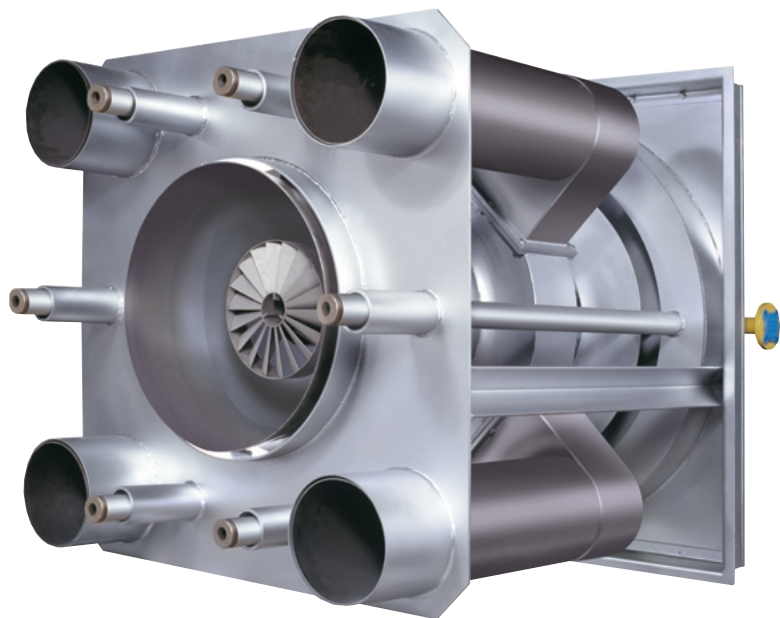
TODD industrial and utility boiler burners have serviced the heating, power generation, chemical processing, manufacturing, food processing, pulp and paper, and maritime industries for nearly a century. That's a track record worth repeating – and we're well on our way.

Today, TODD burners are the industry's choice for reliable, cost-efficient operation and remarkably long life, even in the toughest applications.

## Variflame II

### The Next Generation of Low-NOx Burners – Today

For more than two decades, the TODD Variflame™ has been synonymous with proven sub-30 ppm NOx performance in natural gas-fired package boilers. With thousands of installations to its credit, the TODD Variflame sets the standard in cost-efficient innovation using advanced air-fuel staging techniques and FGR.



Now, we introduce the TODD Variflame II™ – today's intelligent solution for superior performance and dramatic NOx reduction with zero FGR.

### Venturi register

Like its predecessor, the Variflame II uses a venturi register for turbulence-free axial airflow with no moving parts. The venturi shape minimizes pressure loss through the burner and maximizes velocity.

### Swirler

The Variflame II swirler is a proven component for providing the rotational vortex necessary for stable flames and thorough mixing. The swirler creates a tightly controlled primary combustion zone with a fixed ignition point, ensuring reliable operation regardless of firing rate.



The Variflame II features COOLburn™ and COOLflame™, two breakthrough NOx-reduction techniques that join forces with TODD's advanced burner design for remarkably clean, remarkably efficient combustion.

For package boiler applications with burner heat inputs up to 150 million Btu/hr, the Variflame II offers:

- Sub-30 ppm NOx on natural gas – without FGR or steam injection
- Less than 80 ppm NOx firing #2 oil with ultra-low atomizing steam usage and zero FGR
- Low CO, VOC and particulate emissions
- Superior flame stability over existing zero-FGR designs
- No increase in flame length over conventional low-NOx burners
- No moving parts for ultimate reliability – a standard feature on all TODD burners

## COOL Combustion, Dynamic Performance

COOLburn™ uses the energy of incoming combustion air to entrain inert furnace gases and reduce burner emissions while firing gaseous or liquid fuels. This advantage makes the Variflame II an excellent choice for multi-fuel applications.

- Outstanding NOx reduction on gas and liquid fuels
- Compact flame patterns minimize furnace requirements
- Wide range of turndown ratios for maximum operating flexibility

COOLflame™ stages gas injection into the furnace, mixing a portion of the fuel with large quantities of high-temperature furnace gases prior to combustion. The diluted fuel and furnace-gas mixture limit the temperature rise resulting from the combustion process, significantly reducing the formation of thermal NOx.

- Controlled peak flame temperatures when firing gas fuels
- Increased burner stability at low-NOx levels
- Minimized CO and VOC formation

## Experience, Resources, Technology, Commitment

Developed at our International Research and Development Test Center – the most sophisticated facility of its kind in the world – the Variflame II is a product of John Zink Company's relentless commitment to problem solving, diverse specializations and outstanding technological achievements.



Our premiere innovations, unrivaled resources and engineering expertise lead the industry in clean combustion with solutions designed to meet the toughest challenges – today and long into the future.

**Find out today why TODD advanced burner systems are the industry's choice for clean, economical combustion.**





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Developing Clean Air  
Solutions for Planet Earth™

*Manufactured Under Patent  
Number 6,347,935*