

## QLN Burner

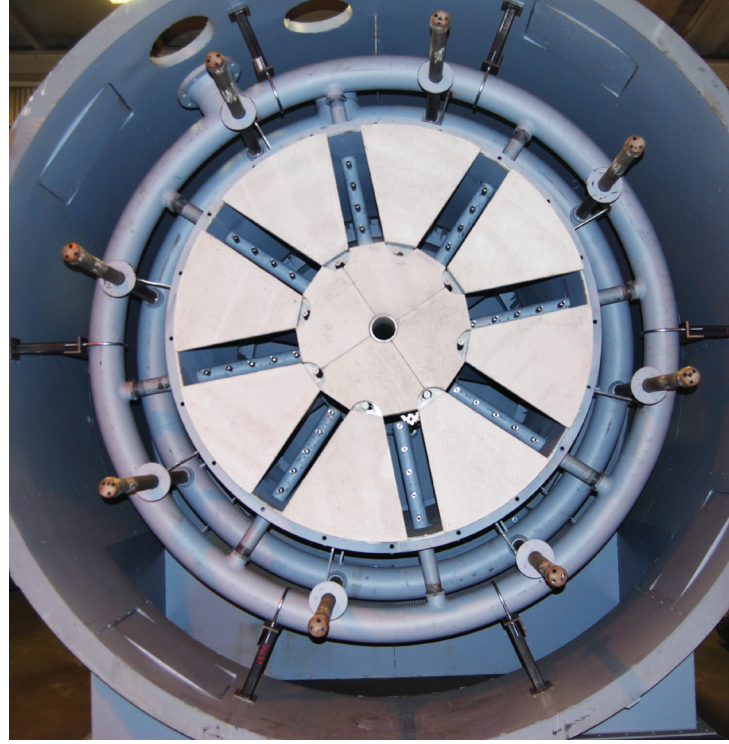
For Steam Flood Generators  
in the Canadian Oil Sands

### Low NOx Without FGR. Ultra-low NOx With Low FGR.

Today's steam flood generator for enhanced oil recovery faces many technical, economical and operational challenges to meet increasingly lower emissions standards. But Coen burners from John Zink Hamworthy Combustion deliver low and ultra-low emission performance with efficient, reliable operation. Our patented QLN™ burner technology offers significant advantages that can translate into thousands of dollars of reduced capital and operational costs for oil production operations. The versatile QLN burner can meet low NOx statutes without the use of flue gas recirculation (FGR) or, when desired, can offer ultra-low NOx emissions with just a small amount of FGR.

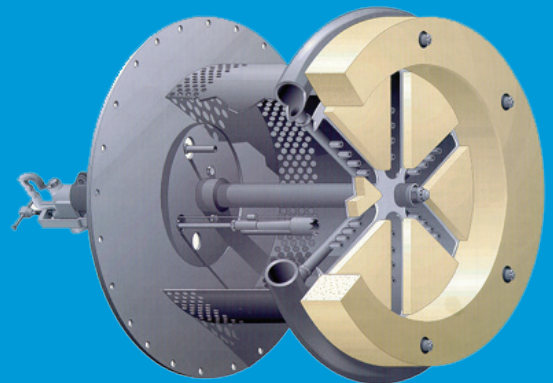
#### Simplicity and Versatility

The easy operation and maintenance of the QLN burner is ideal for steam flood generators that are often required to operate unattended for extended periods of time. In addition, QLN burner packages are available in a variety of configurations for operations: without FGR, with induced FGR or with forced FGR coming from a dedicated FGR fan. Our experts can help determine the optimal solution depending upon the target level of NOx and the sulfur content in the fuel. QLN burner packages can also be designed up-front to meet current regulatory requirements and be Future Regulatory Ready (FRR).

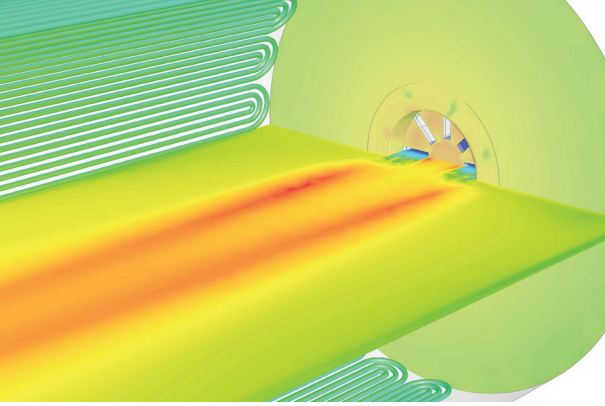


### QLN At A Glance.

- + Can meet low NOx statute of sub 26 g/GJ without the use of FGR
- + Can meet ultra-low NOx statute of sub 7.9 g/GJ with low levels of FGR
- + Delivers improved operational efficiency with excess air as low as 5% at full load conditions
- + Installs easily with integrated bolt-on package
- + Offers wide stability limits
- + Provides even heat distribution
- + Fires variable Btu fuels such as natural, mixed and produced gas



QLN burner – Patented low NOx design



Using state-of-the-art computational fluid dynamics (CFD) modeling techniques, we can maximize your facility's operating performance and achieve your emission requirements. With CFD analysis, we can predict and improve air distribution, flame characteristics and pollutant formation for optimal combustion.

## Proven Performance For Canadian OTSG

Designed for simple and reliable operation, our burners have proven efficient and effective in more than 400 OTSG unit installations. We can design systems to meet various guidelines, codes and emissions requirements, offering single-burner capacities to 420 MMBtu / hr.



OTSG unit with QLN burner.

## Additional Solutions and Support

We know a burner may not solve all your challenges. That's why we offer a comprehensive line of burner packages, safety systems and auxiliary products – the most advanced and dependable available. From cost-effective predesigned control systems with operator interface and custom-engineered burner management control systems to ancillary components including burner ignition systems, burner flame detection systems, fuel valve trains and more, our proven solutions work hand-in-hand with your combustion equipment. You can also rely on our experience and expertise through worldwide support services including:

- + CFD modeling
- + Installation
- + Startup service
- + Operator training
- + Preventive maintenance
- + Complete turnkey service
- + After sales support



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