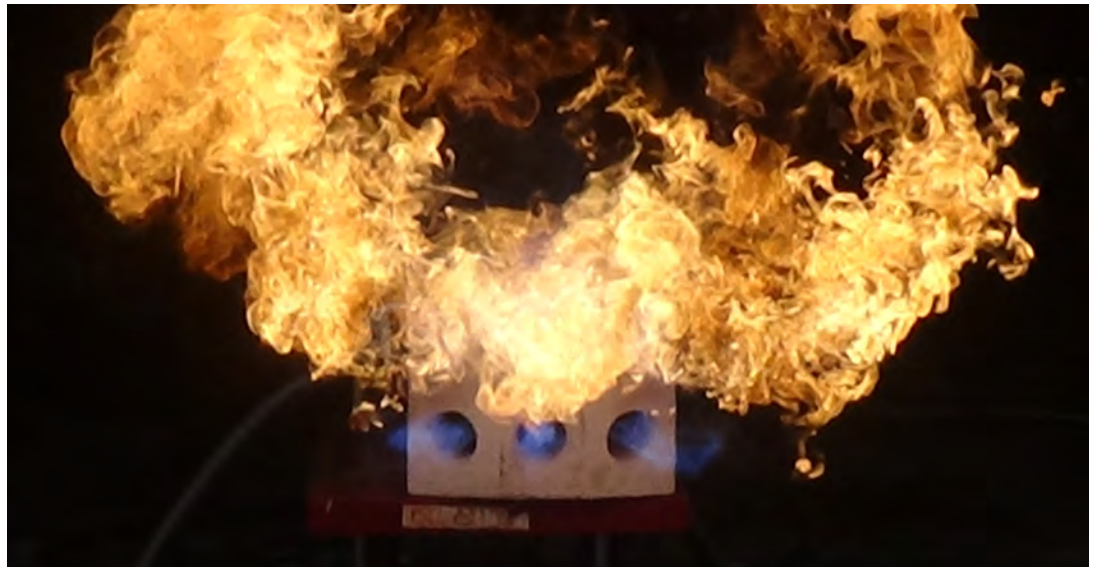


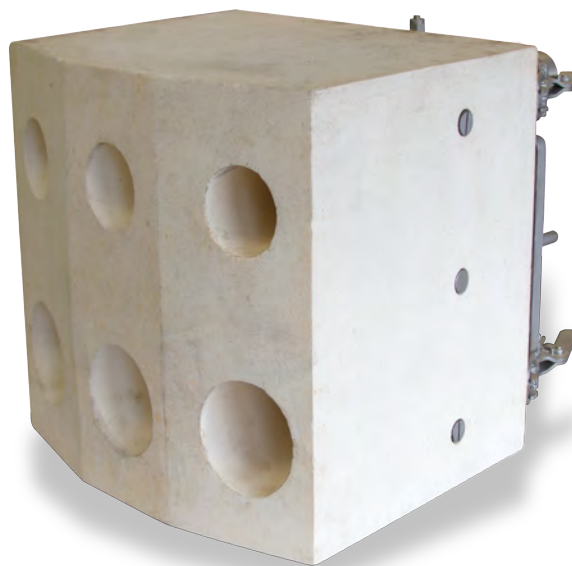


OPTIFIRE™ XD Burner



Linde's new OPTIFIRE™ XD burner is an extreme duty burner designed to offer a continuous, low-momentum flame with reduced maintenance interruptions. The XD burner works to mitigate condensate build-up around the cooler oxygen ports. This is an important feature because most staged oxy-fuel burners that operate in a glass atmosphere, tend to build up condensate fairly quickly with continuous furnace operation.

The build-up around the cooler oxygen is common and a result of the volatile-rich furnace zone in which the cooler oxygen (O_2) ports operate, as seen in Figure 1.



**“Quick-release” feature
makes for easy installation
and removal**

This excess build-up can lead to reduced heat transfer efficiency to the glass and reduced burner block life. Linde's new OPTIFIRE™ XD burner is designed to address this specific need.



Figure 1. Typical condensate build-up seen around cooler oxygen ports of staged oxy-fuel burners in a volatile rich furnace zone.

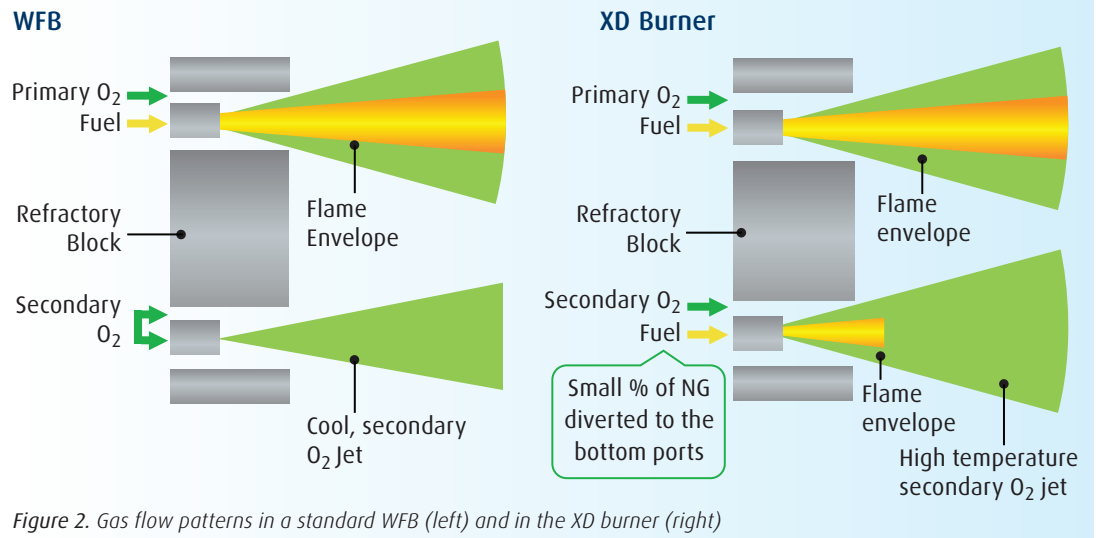


Figure 2. Gas flow patterns in a standard WFB (left) and in the XD burner (right)

The XD burner is a variant of Linde's standard wide flame burner (WFB). It was engineered to provide enough heat to the cooler oxygen ports, preventing condensation of alkali vapors from the glass atmosphere. It produces the same highly luminous, low momentum, flat flame that has set apart Linde's wide flame burner technology for years with a small percentage of natural gas diverted to the bottom ports (see Figure 2).

**Benefits of the
OPTIFIRE XD
burner include:**

- Mitigating condensate buildup on the cooler O₂ ports
- Reduced burner maintenance time
- Luminous flat flames covering a large glass surface area
- Low momentum flames that result in reduced volatilization and batch carryover
- Up to 50% lower NO_x in comparison to conventional oxy-fuel burners
- No water cooling required
- Light weight and easy to install

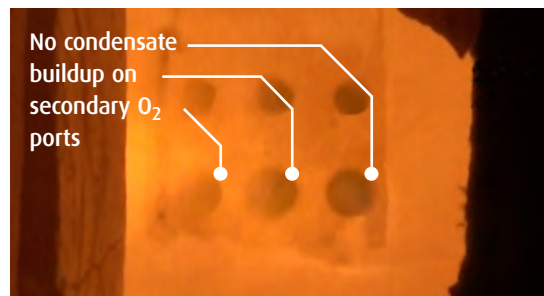
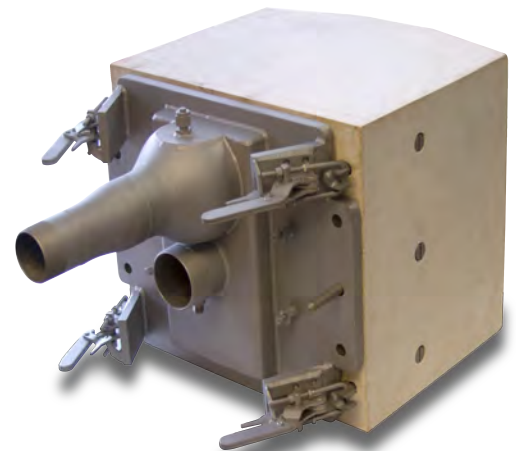


Figure 3. XD burner showing no signs of build-up after over 7 months of continuous operation in a glass furnace



The XD burner performance has been demonstrated in multiple fiberglass and container glass furnaces. The XD burner in Figure 3 has been operating in one of these furnaces for over seven months with zero evidence of condensate build-up and zero maintenance requirement.

Linde will work with your engineers and procurement specialists to design a fully integrated package that meets your specific glass processing needs. For more information about the OPTIFIRE XD burner contact us at [1-844-44LINDE](tel:1-844-44LINDE), or visit our website at www.lindeus.com.

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