Over-Fire Air (OFA) System

Fuel Tech’s Over-Fire-Air (OFA) system deeply stages combustion for enhanced NO\textsubscript{x} reductions. Additional NO\textsubscript{x} reductions of 35% to 50% are possible on Wall, Tangential, Turbo or Cyclone fired boilers of all fuel types. The unique port design will enhance mixing to limit impact on combustion efficiency.

How Fuel Tech’s OFA System Will Reduce NO\textsubscript{x} Emissions

Combustion air is diverted from the burners to create a fuel rich zone in the lower furnace. Fuel-bound nitrogen conversion to NO is inhibited on coal and oil fired boilers. Peak flame temperatures are reduced on gas fired boilers to limit thermal NO\textsubscript{x} formation. A high momentum air stream intersects the burner combustion gasses in the upper furnace to complete combustion prior to the boiler convective section.

The Hardware

The OFA port is shaped by refractory “boot” with combustion air fed through a 310 SS duct for long life. Automated damper controls allow for tuning through the load range. Full furnace Computational Fluid Dynamics modeling is performed on each project. OFA port sizes and shaping are determined to maximize combustion air penetration and furnace coverage.

The port utilizes a venturi design with zone disk to accurately control airflow through the OFA port.

- OFA ports fabricated from ¼” 310 SS material.
- OFA register assemblies fabricated from ¼” 310 SS material.

Features Include:

- Additional NO\textsubscript{x} reductions of 35-50%
- Custom designed port geometry
- Stainless steel construction
- OFA flow control dampers for automatic operation

Fuel Tech
Technologies to enable clean efficient energy
Deep-Staging for Maximum NOx Reduction

Fuel Tech Low NOx Burners & OFA Wall-Fired Coal Boiler NOx vs. BZHR

This graph illustrates NOx reduction capabilities for both eastern bituminous and subbituminous coal. Fuel Tech’s Low NOx burners and OFA systems provide maximum NOx reduction across a wide range of Burner Zone Heat Release (BZHR) values.

Over Fire Air NOx Reduction

Over fire air is injected into the furnace above the top row of burners and completes the combustion of the unburned CO prior to the gases passing through the superheater.

Fuel Tech’s modeling expertise and proven field results allow us to guarantee OFA system performance.