

### A sampling of benefits:

In recent wood-waste fired OFA projects, the following benefits were achieved by the Jansen OFA system upgrade:

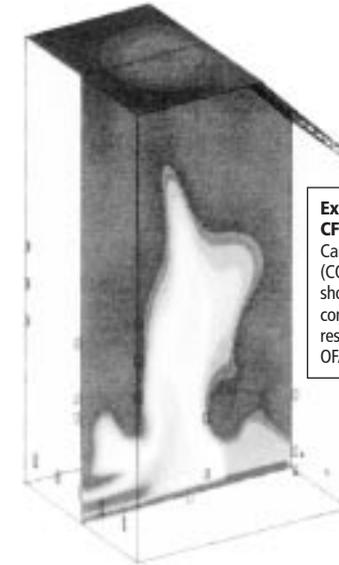
- Reduction in CO stack emissions from 1500 ppm to below 250 ppm
- Reduction in VOC/hydrocarbons stack emissions from 500 ppm to below 25 ppm
- Reduction in amount of fly ash carryover by 30%
- Elimination of fly ash re-injection system due to low carbon content
- Reduction by 75% or more in fuel oil consumption
- Rapid and complete incineration of HVLC NCG without causing odor problems in the boiler house
- Increase in bark firing rate by 50%
- Follow load swings on bark alone (no gas/oil) in steaming range of 50,000 to 300,000 lb/hr
- Elimination of puffing and combustion instabilities
- Elimination of delayed combustion and superheater temperature excursions
- Project payback time within six months



Would you like to burn  
more wood-waste

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## Would you like to burn more wood-waste?



**Example  
CFD Modeling;**  
Carbon monoxide  
(CO) profile  
showing high  
concentrations  
resulting from poor  
OFA delivery

## Can your boiler handle it?

**Are emissions  
limiting operations?**

**Are high oil/gas  
prices hurting your  
bottom line?**

**Problem  
Solution**

JANSEN

## Problem

## Solution

### Does your wood-waste fired boiler experience any of the following problems?

- High emissions of CO and VOC
- High ash carryover from the furnace
- High unburned carbon content in the fly ash
- Combustion stability problems, furnace puffing
- Delayed combustion into superheater, high gas temperatures and steam temperature excursions
- Need for high excess air usage
- Tube erosion from carryover
- High stack opacity
- High auxiliary fuel firing rates and associated costs
- Inability to burn more biomass fuel (wood-waste, sludge)
- All of the above

### You are not alone!

Many wood-waste fired boilers experience the kind of operating challenges listed above. Typically, the problems are symptoms of poor combustion that is caused by inefficient overfire air (OFA) delivery.

In some boilers, poor OFA system design is characterized by numerous small air ports that are located at different elevations on the boiler's front and rear walls. Small air jets do not penetrate deep into the furnace and do not provide uniform cross-sectional coverage of combustion air. In other boilers, tangential or cyclonic OFA is delivered, resulting in insufficient mixing of air with combustibles prior to the furnace outlet.

Poor air delivery leads to weak combustion, which is often the root cause of the wood-waste fired boiler problems listed above.

### Jansen OFA System Upgrade Using High Energy Combustion Air Nozzle

#### Jansen OFA nozzles achieve:



- High air jet velocity at nozzle tip
- Deep jet penetration inside furnace cavity
- Turbulent mixing of combustion air with combustibles
- Dampers on each nozzle for trimming air flow
- Air flow measurement capability at each nozzle
- Capability to inject HVLC NCG; without leakage
- Low pressure loss; new FD fan typically not needed
- No/low maintenance

### Contact us:

For information please contact Ned Dye (ext. 125) or Arie Verloop (ext. 111) at 425.825.0500.

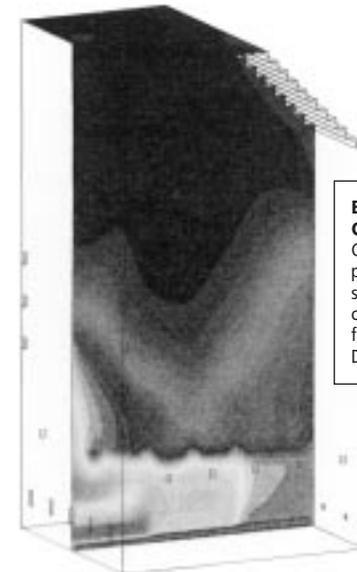
Visit our new website:

[www.jansenboiler.com](http://www.jansenboiler.com)

### Project Scope:

The Jansen scope of supply on your wood-waste fired boiler OFA system upgrade may include any or all of the following aspects:

- Detailed process engineering evaluation
- Computational Fluid Dynamics (CFD) modeling
- OFA delivery system with High Energy Combustion Air Nozzles
- Bark handling and feed system
- Instrumentations and controls; firing strategy
- Grate replacement
- Pressure part replacements (i.e., wall panels)
- Disposal of HVLC NCG using new OFA system
- Engineer-Procure-Construct (EPC) project responsibility



**Example CFD Modeling:** Carbon monoxide (CO) profile showing significantly reduced concentrations resulting from Jansen OFA Delivery Upgrade