

Project Description



*No. 2 Bark Boiler Overfire Air System
Mead Coated Board Inc.
Phenix City, Alabama*

Project Scope

JANSEN provided the engineering and supply of the new overfire air (OFA) system for the No. 2 Bark Boiler at the Mead Coated Board Inc. mill in Phenix City, Alabama. The No. 2 Bark Boiler is an early 1980s vintage CE VU-40, waste wood boiler with a traveling grate and five pneumatic fuel feeders. The boiler burned a combination of waste wood and primary mill sludge, and had difficulties consistently meeting carbon monoxide (CO) emissions levels without the use of auxiliary fuel (natural gas).



The old “cyclonic” upper air system was removed and ten Jansen High Energy Combustion Air Nozzles™ were installed on the side walls of the furnace (five on the left wall and five on the right wall). The large, aerodynamically efficient nozzles provide high momentum, high energy jets that penetrate well past the center of the furnace.

The nozzles were arranged to provide interlaced OFA jets that create a plane of turbulent combustion several feet above the elevation of fuel distributor spouts. JANSEN used Computational Fluid Dynamic (CFD) modeling to optimize the design of the system. This combustion zone provides the necessary mixing to burn out the volatiles and fines that rise up off the grate, or are released in suspension by the fuel feeders.

Because the JANSEN nozzle has very low pressure loss, the existing forced draft fan was more than adequate to supply the necessary flow and pressure to the new OFA system without modifications.

Results

The JANSEN OFA system was installed in September 1999 as scheduled. Performance trials run in October showed that the boiler can now consistently operate well below the permit CO limit of 0.4 lb/MMBtu while burning waste wood/sludge mixtures at the full steaming rate of 300,000 lb/hr. Also, the boiler has exhibited a significant reduction in the amount of ash and char carryover out of the furnace.

A new control system was installed at the same time as the new OFA system. With these modifications, the boiler has been able to follow mill steam demand on waste wood fuel only (no auxiliary fuel) from 50,000 lb/hr up to 300,000 lb/hr.

With these upgrades, the boiler has performed well and the owner has been very pleased. The second bark boiler at this mill (No. 1) was also upgraded successfully by JANSEN several years later.