

PROJECT CAPABILITIES

BIOMASS BOILER COMBUSTION SYSTEM UPGRADES



Many biomass fuel-fired boilers experience challenges that prevent higher biomass (i.e., wood and agricultural waste and/or sludge) fuel burning rates at significant lower operating cost. For example, the unit may experience high CO emissions and excessive carryover of fly ash, and/or may experience combustion instabilities with the need for continuous co-firing of auxiliary fossil fuel to sustain combustion.

All these problems are symptoms of poor combustion that is caused by ineffective overfire air (OFA) delivery. JANSEN's modern, sidewall, high capacity OFA system has proven that these problems can be solved. Our sidewall OFA system creates a zone of turbulent mixing across the full furnace cross section in which fines and volatiles are rapidly burned.

A limited number of relatively large OFA nozzles are used. Because the patented JANSEN air nozzles have very low internal pressure losses, our OFA system can typically be installed without the need for new or modified forced draft (FD) fan(s). Installation time is during a five to seven day outage.

Operational benefits (and associated economic and environmental impact) that are normally achieved are:

- Reduced reliance on auxiliary fuel to maintain combustion (lower fossil fuel cost).
- Ability to burn additional biomass fuel (lower fossil fuel cost).
- Reduced carryover of fly ash (lower landfill cost).
- Reduced carbon content in fly ash (improved thermal efficiency).
- Reduced excess air usage (improved thermal efficiency).
- Reduced CO, NO_x, and VOC emissions (higher efficiency and improved emissions compliance).
- Reduced flue gas temperature into the superheater (less erosion/tube wastage).
- Improved combustion stability and reduced furnace puffing (this may be a safety issue).
- Efficient incineration of HVLC NCG.
- Boiler MACT Compliance.

Selected References (see next page)

Selected References

Biomass Boiler Combustion System Upgrades

Alabama River Pulp Company - Perdue Hill, AL
 Appleton Papers, Inc. - Roaring Spring, PA
 Boise Building LLC - Medford, OR
 Boise Cascade Corporation - Steilacoom, WA
 Boise Paper - Wallula, WA
 BTG Slovensko - Chemes, Slovakia
 CAIG, SA, Ingenio Madre Tierra - Santa Lucia, COTZ, Guatemala
 Cariboo Pulp & Paper - Quesnel, BC
 Catalyst Papers - Port Alberni, BC
 Consolidated Papers, Inc. - Wisconsin Rapids, WI (2 units)
 Daishowa America - Port Angeles, WA
 Daishowa-Marubeni Int. Ltd. - Peace River, AB
 Dominion Virginia Power - Altavista, VA (2 units)
 Domtar Industries - Ashdown, AR
 Domtar Industries - Kamloops, BC
 Domtar Industries - Rothschild, WI
 Domtar Industries - Windsor, PQ
 Georgia-Pacific Wood Products - Pineland, TX
 Great River Energy - Elk River, MN
 Harmac Pacific - Nanaimo, BC
 International Paper Company - Augusta, GA
 International Paper Company - Bastrop, LA
 International Paper Company - Courtland, AL
 International Paper Company - Franklin, VA
 International Paper Company - Georgetown, SC (2 units)
 International Paper Company - Jay, ME
 International Paper Company - Mansfield, LA (2 units)
 International Paper Company - Pensacola, FL
 International Paper Company - Pine Bluff, AR
 International Paper Company - Pineville, LA
 International Paper Company - Prattville, AL
 International Paper Company - Riegelwood, NC
 International Paper Company - Saillat, France
 International Paper Company - Selma, AL
 International Paper Company - Texarkana, TX
 International Paper Company - Ticonderoga, NY
 Koch Cellulose - Brunswick, GA
 Longview Fibre - Longview, WA
 Mead Coated Board Inc. - Phenix City, AL (2 units)
 Mead Paper - Chillicothe, OH
 MeadWestvaco Corporation - Covington, VA (2 units)
 MeadWestvaco - Phenix City, AL
 Minnesota Power - Duluth, MN (2 units)
 NewPage Corporation - Escanaba, MI
 NewPage Corporation - Wickliffe, KY
 Packaging Corporation of America - Counce, TN
 Packaging Corporation of America - Valdosta, GA (2 units)
 Plum Creek Manufacturing - Columbia Falls, MT
 Port Townsend Pulp Company - Port Townsend, WA
 Rayonier, Inc. - Jesup, GA
 Resolute Forest Products - Catawba, SC
 Riverside/Tolko - Armstrong, BC
 SAPPi Fine Paper North America - Cloquet, MN
 SAPPi Fine Paper North America - Skowhegan, ME (2 units)
 Simpson Tacoma Kraft - Tacoma, WA
 Smurfit-Stone Container Corporation - Hodge, LA
 Smurfit-Stone Container Corporation - Missoula, MT
 Smurfit-Stone Container Corporation - Portage du Fort, PQ
 Smurfit-Stone Container Corporation - West Point, VA
 Tolko Manitoba - The Pas, MB
 West Fraser Mills Ltd - Hinton, AB
 Westvaco Corporation - Silsbee, TX
 Willamette Industries, Inc. - Campti, LA
 Weyerhaeuser Company - Bennettsville, SC
 Weyerhaeuser Company - Columbus, MS
 Weyerhaeuser Company - Longview, WA
 Weyerhaeuser Company - Valliant, OK