

Biomass Boiler Evaluations

Biomass is a challenging class of fuel. Its variable moisture content, heating value, size distribution and inconsistent material flow from pile to boiler furnace conspire to make efficient combustion difficult. A biomass boiler performance review evaluates its systems and controls to determine a benchmark. This benchmark is used to identify existing and potential process bottlenecks, and aids in developing a plan for optimizing combustion and maximizing steam generation from biomass, while reducing the need to co-fire fossil fuel.

The direct payback of burning more of the less expensive biomass is attractive, but other benefits are gained also. Overall thermal efficiency is improved, carryover through the boiler's convective sections reduced, and emissions held in compliance. All of which lead to improving the availability and operational flexibility of the unit.

Jansen has conducted engineering evaluations on over 250 biomass fired boilers world-wide, designed by OEMs large and small. Our practical experience across this boiler landscape allows us to provide process and equipment solutions that are truly custom to meet your goals.

Areas of Evaluation

- Fuel feed system capacity and performance
- Biomass fuel - composition, heating value, size distribution
- Combustion air system - primary/secondary air balance, pressures, air in-leakage
- Combustion air and flue gas flow - via in-house Computational Fluid Dynamics (CFD) modeling
- Component performance - superheater, economizer, and tubular air heater heat transfer, erosion & corrosion potential, air in-leakage, fan & pollution control device capacities & performance, flue gas exit temperatures
- Boiler circulation - using Ultrasonic Flow Metering (UFM)
- Non-condensable gas incineration - concentrated & dilute
- Ash loading & system capacity
- Emissions - O₂, CO, NO_x, char, and ash carryover
- Boiler MACT Compliance Review and Implementation

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