

PULP & PAPER RECOVERY BOILER MONITORING



*The Kurz Insertion
Mass Flow Meter products
provide extremely
reliable and accurate
measurements for the
harsh environment of a
recovery boiler facility,
without restricting airflow
even in short run ducts*



complex technology
MADE SIMPLE

Pulp and Paper: Recovery Boiler Monitoring



Recovery Boiler Introduction

Pulp and paper mills use a number of processes that enable the recovery and reuse of the inorganic pulping chemicals used to convert wood into paper and cardboard goods. This recovery process begins with debarked and chipped wood that is pressure-cooked in a digester with white liquor, a mixture of sodium sulfide and sodium hydroxide. The cooking process breaks down the lignin, which is the substance that holds the wood fibers together and the lignin, along with the white liquor forms a mixture known as black liquor.

The black liquor is then concentrated through several stages of evaporation and steam heating, until it consists of approximately 65% solids. The concentrated black liquor is then burned in the recovery boiler, which produces a residue of molten chemicals that is now referred to as green liquor. By adding water and lime, the green liquor is processed through the lime kiln and turned back to fresh white liquor that can be used again in the digester, thus completing the recovery and reuse cycle.



In order to optimize the efficiency of the combustion process at the core of this extensive cycle, the quantity and flow of air to the boilers is critical. Short runs of ducts with difficult flow patterns, along with the dirty and harsh environment, cause challenges to obtaining reliable and accurate combustion air flow measurements.

Customer Application and Performance Issues

A pulp and paper mill customer had almost a dozen mill sites throughout the United States. Reliable and accurate measurements were not being achieved with differential pressure products that were being used, such as air foils and pitot tubes, and the sensors were easily plugged with ash and buildup in the dirty environment of the combustion burner. In addition, a significant amount of energy was being used to move air in the ducts with these restrictive flow devices.

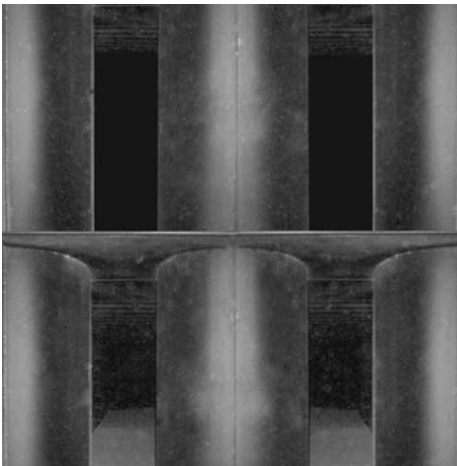
The Kurz Solution

The company outfitted all of their mills with Kurz Insertion Mass Flow Meters. The Kurz 454FTB and K-Bar 2000B are used in combination to provide primary, secondary and tertiary air monitoring with excellent customer benefits. The main engineer on this project selected Kurz Instruments for the following reasons.

- The Kurz equipment offers very excellent calibration, containing a robust measurement conversion technique for signal processing.
- The signal processing is easily available to the end user and allows modifications to adapt the measurement to the flow profile of the duct. This is extremely important to obtain accurate measurements.

Benefits of the Kurz Solution

- *Extremely Accurate and Reliable measurements*
- *Works Well in Short Runs*
- *End-User Programmability*
- *No Restrictive Air Flow*
- *Low Maintenance Even in Harsh Environments*
- *Increases Combustion Efficiency*
- *Long Product Life*



The top photo is inside a primary air duct with an installed set of Air Foils. The lower photo shows a similar size duct with the Kurz K-Bar Sensors, which do not impose any type of significant flow restriction, and in fact are a very similar profile to the duct support bars that are also shown in the photo.

The Kurz Solution - Continued from Previous Page

- Kurz Mass Flow Meters do not impose any type of significant flow restriction in the ducts. The energy to move air from one location to another is not restricted by the flow measurement device, increasing boiler performance efficiency.
- Because of the design profile, Kurz sensor elements do not require continued attention or any blowing out of the sensor area. Less maintenance saves time and ensures greater overall accuracy levels.
- The new age recovery boiler is the next generation of biofuel tools. Burning off of an organic component of the actual pulping system reduces the amount of fossil fuel used by the plant. Monitoring and measurements from the combustion air ducts that feed the recovery boiler is critical to higher performance and greater capacity within this recovery cycle.

Performance Results with the Kurz Solution

The Kurz Instruments line of Insertion Mass Flow Meters repeated success over a long period of time for this National string of pulp and paper mills. Thousands of probes were used throughout their entire facilities with extremely high consistency in product performance.

About Kurz Instruments

Kurz Instruments has maintained a reputation for designing and manufacturing Thermal Mass Flow Transmitters for industrial air and gas flow applications. Our engineers, product development specialists and management staff have developed products to operate in the harshest of environments. For more than 30 years, our entire team has provided solutions to our customers most demanding and difficult applications.

Kurz products are used in a wide variety of industrial applications including combustion air, aeration air flow and digester gas, nuclear power plants, pump protection, flare stack monitoring and compressed air, to name only a few.

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