

1992 **Title:** **Use of Design and Operating Data to Determine Recovery Boiler Upgrade Potential**

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ABSTRACT:

The maximum capacity of an existing recovery boiler is determined by its design, and by the liquor composition and combustion related factors. Regardless of capacity, recovery boilers are designed for similar flue gas temperatures entering the superheater. Predicting the upgrade potential of a recovery boiler requires evaluation of all of the key design and operating variables that determine the performance of that specific unit.

Recent data from field testing of approximately fifty recovery boilers shows that most units can operate on a sustainable basis of 5% to 10% above design solids input rating. However, in many cases, this is a result of the actual liquor heating value being lower than the design value. If so, the boiler may not meet the design heat input rate. In addition, in the mill environment, boiler throughput is generally quoted "as fired," including ash recycle, while design capacity always denotes firing rate before make-up and recycle.

Overall boiler performance figures such as flue gas temperatures and heat and solids input rates are not always unconditional indicators of recovery boiler capacity. Boiler testing shows that variations in liquor composition and sub-optimal combustion conditions can lead to substantial differences in sustainable heat and solids input rates, for geometrically similar boilers. These factors must also be taken into account when assessing the potential of a boiler to be upgraded.