

From Research to Improved Recovery Boiler Technology

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Recovery boiler technology has been a product of continuous global collaboration and development over the past few decades. This progress has been driven by the genuine engineering work at manufacturing companies, which has been further enhanced by the deep understanding of various processes and materials details, thanks to the well-focused fundamental research activities at numerous research laboratories and universities worldwide.

At our 50th-anniversary meeting a decade ago, we had the privilege of discussing and presenting ten most significant research efforts that have left a lasting impact on recovery boiler development. A panel of top industry experts from Europe and North America evaluated and ranked the significance of these efforts. These 'Most Successful Recovery Boiler Research Efforts', have paved the way for many advancements we see today. The five highest ranked ones dealt with: i)-Lower Furnace Wall Corrosion; ii)-Dust Chemistry and Melting; iii)-Single Droplet Combustion Characterization; iv)-CFD Based Furnace Modeling; and v)-High Solids Firing. (If you have forgotten this study, you can find it in the Proceedings Book of 2015*)

In today's presentation, we look for similar but more recent research activities that have supported or may, in the future, significantly support further development of the recovery boiler technology and operation. We have identified a variety of interesting recent and ongoing research activities at different research organizations.

Among others, recent research has produced new findings related to superheater deposits, corrosion, and soot-blower technology. Promising work is happening in modeling and machine learning related to recovery boiler operation, such as the development of predictive models for boiler performance. Recent research has also focused on the smelt's flow properties and fate in the dissolving tank and green liquor, with the aim of optimizing the smelt dissolving process.

We will present fifteen recent research topic areas in total. As we did ten years ago, we have again received evaluations and comments from a new international recovery boiler expert panel. The panel, consisting of top industry experts from Europe and North America, rigorously evaluated each research topic area based on its potential impact and relevance to recovery boiler technology. Finally, we will more closely describe the five highest ranked efforts.

In conclusion, recovery boiler technology development still requires support from longer-term cross-disciplinary research. It is very important that several active research groups focus on recovery boiler-related topic areas.

**" Continuous Development of Recovery Boiler Technology – 50 Years of Co-operation in Finland" by Suomen Soodakattilayhdistys – Finnish Recovery Boiler Technology Committee, Helsinki 2015.*