

Conclusion

It can be concluded that the moisture content has a significant effect on the boiler in more than one way and that a significant variation in the fuel moisture will impact the boiler design.

The moisture loss is the single biggest loss on a bagasse fired boiler. Both the moisture and the carbon loss are directly linked to the fuel moisture so it can be concluded that reducing the moisture content will yield a significant efficiency improvement. Furthermore, it also impacts the pressure drop and the erosion rate across the boiler thus both the maintenance and the parasitic load reduce along with the moisture content.

Bagasse drying technology has not been used in Africa but there are plants operating abroad which have proven to be economically viable. There are site specific and economic factors such as the price of coal and electricity which have a major influence on the feasibility of a bagasse dryer. However, due to the potential fuel saving it is worthwhile for plants burning coal to consider the feasibility of a bagasse drying plant. For those plants burning little to no coal, effort should be spent on reducing the moisture content of the bagasse by means of optimising the milling setup of the milling tandems or drying mills to achieve the correct bagasse moisture without affecting the cane throughput.

REFERENCES

- American Standard of Mechanical Engineers (2013) *ASME PTC4*, Section 5-7: Fired Steam Generators. *Performance Test Codes - Efficiency*.
- Ganapathy V (1993). *Steam Plant Calculations Manual*. Chapter 2 - Fuels, combustion, and efficiencies of boilers and heaters. 2nd edn. New York: CRC Press.
- Kotze C (2016). Four ways of improving boiler efficiency: Pg.1-2
- Magasiner N (1987). The effect of fuel moisture content on the performance of a typical bagasse fired water tube boiler. *Proc S Afr Sug Technol Ass* 61: 86-89.
- Moor B (1985). A reliable high efficiency sugar mill boiler. Proceedings of the South African Sugar Technologists' Association, June 1985.
- Wienese A (2001). Boilers, boiler fuel and boiler efficiency. *Proc S Afr Sug Technol Ass* 75: 278