

POSTER SUMMARY

**PRACTICAL USE OF NIRS FOR FACTORY PROCESS CONTROL
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All of the South African sugar mill laboratories have access to Near Infrared Spectroscopy (NIRS) instruments with process stream calibrations supplied by the Sugar Milling Research Institute NPC (SMRI). The calibrations include sucrose, fructose, glucose, pol and brix predictions for mixed juice, clear juice, syrup and all the various grades of molasses and massecuites. Further to this, dry solids can be predicted on C-molasses, and conductivity ash on mixed juice and C-molasses.

The rapid and reliable predictions by NIRS can be used by factories to improve recoveries and reporting of factory performance figures. This poster elucidates some approaches on how to achieve this.

Included in the poster are details of:

- Inversion loss determinations. Factory tests across an evaporator station are reported on, as well as the method developed for these tests.
- Sucrose-based factory performance parameters on intermediate streams e.g. exhaustions and crystal contents. These are calculated from gravity purities and as such are affected by changes in the pol/sucrose ratio; a move to reporting on sucrose-based apparent purities eliminates the effect of the pol/sucrose ratio changes.
- The use of NIRS to predict the C-molasses Target Purity Difference (TPD). These analyses have traditionally been performed at the SMRI, which is not ideal for factory control purposes as the information provided would be at least a week old. The almost immediately available NIRS predicted TPD results can now be used to revise massecuite and seed purities timeously. The NIRS TPD analyses can also be performed on a shift-basis as a check on each centrifugal to assess where sucrose may be lost. At present 'purity rise' across the centrifugals aims to do this but, at best, only one centrifugal is tested per shift due to lack of personnel and the limited number of Nutsch filters.

Keywords: NIRS, laboratory, UDL, TPD, inversion, sucrose