

POSTER SUMMARY

THE EFFECT OF ROTOCLONE BACTERIAL SLIME ON THE REFINED SUGAR TURBIDITY INCREASE EXPERIENCED AT THE NOODSBERG REFINERY

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Abstract

Refined sugar turbidity is measured in terms of the International Commission for Uniform Methods of Sugar Analysis Units (ICUMSA Units or IU). During the latter part of the 2016 season, the Noodsberg refinery experienced severe turbidity contaminations. Turbidity measurements in the raw melt ranged from 900 to 3511 IU. Under normal circumstances, this turbidity would be removed via the clarification and filtration stages, however, the turbidity experienced was evident in all stages and subsequently appeared in the refined sugar final product. The refined sugar product during this period far exceeded bottlers' specification of less than 20 IU (Maseko *et al*, 2011), with the refined sugar turbidity measuring as high as 160 IU. This resulted in sugar being rejected. Investigations found that bacterial slime growth cleaned from the silo rotocclone on a maintenance stop day was inadvertently washed into the melt water tank. Analytical tests and literature led the author to assume that the slime bacteria was *Leuconostoc*. The author set about to simulate the slime contamination with refinery process streams in the mill laboratory. Multiple refinery streams, such as melt, clarified, filtered and fine liquor, were sampled. Food technology research (Hill, 2009), suggests that *Leuconostoc* creates products that introduce haziness into the solution. This phenomenon was observed in the plant during the high turbidity period as well as during laboratory trials. A directly proportional relation was then established between the bacterial slime concentration and turbidity increase across all of the refinery streams that were sampled. This poster highlights the adverse effects that rotocclone bacterial slime contamination caused by *Leuconostoc* can have on refined sugar quality, which subsequently emphasises the importance of having proper sanitation procedures in place.

Keywords: refinery, turbidity, slime, Leuconostoc, contamination, sugar quality