

## Financial analysis for installation of Neltec ColourQ 1700 CC onto C massecuite fugals

For your interest a financial analysis has been undertaken to assess the benefits/costs of installing Neltec ColourQ 1700 CC transducers onto continuous C massecuite fugals. The analysis is based on the experiences at Isis Mill, Australia (Pike *et al.*, 2019) of using the Neltec transducer to control the C sugar colour (inferred purity) in a Silver 52/30 fugal with the signal used to regulate the water spray onto the fugal basket in feedback control. The results of the financial analysis are summarised in the tables below (\$ are Australian dollars).

Item for the installation	Cost, \$
Neltec Control Unit	20,600
Two Read Heads (\$32,000 each)	64,000
Software	11,750
Installation of the Control Unit and Read Heads	10,000
Upgrade of control systems on two fugals	13,000
<b>TOTAL INSTALLATION COST</b>	<b>119,350</b>

Parameter	Value
Cane crop, t	1,400,000
Reduction in final molasses purity	0.5
Sugar price, \$	350
Molasses price, \$	120
Savings on the pan stage, \$	15,000
Savings from labour, \$	10,000
Period, years	10

Parameter	Value
Discount rate, %	12
Discounted benefits, \$	535,000
Internal rate of return, %	242
<b>Payback period</b>	<b>1.5 years</b>

The assumptions for the financial analysis are:-

- A Neltec transducer is installed on each of two high capacity centrifugals (capacity ~ 14 t/h each) which together are sufficient to process the total C massecuite production of the factory. Standby fugals are not fitted with the colour transducers.
- Three sources of additional revenue/cost savings are expected through tight control of C sugar purity:-
  - The C molasses purity is reduced by 0.5 unit. This change provides the largest boost to revenue. This value is an estimate based on factory data but was not able to be proven definitively in the test program.
  - The fugal operator has more time to attend to other duties e.g. operation of batch fugals producing shipment sugar and sugar drying, thus providing increased efficiencies in the operation of the whole station.
  - Greater consistency in the recycle of impurities to the pan stage and the breakage of the C sugar magma which is used as foundation crystals for the A and B shipment sugar massecuites. Improved outcomes (purity control, exhaustion) on the pan stage will be achieved.
- No additional costs of analysing C sugar to assist with calibration of the Neltec transducer to C sugar purity are incurred (Refer Pike *et al.*, 2019).
- The two transducers are bought and installed in the same financial year as the first financial benefits are obtained.

Reference: Pike D, King S, Broadfoot R, Woods P (2019) Proc Australian Society Sugar Cane Technol., 41, 452-463.

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