LASERCUT STAINLESS STEEL CENTRIFUGAL SCREENS

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Mill technologists have been unhappy with the performance of chrome nickel centrifugal screens for many years. Chemical attack at microcracks in the chromium surface results in flaking of the chromium and exposure of the soft nickel base. Rapid erosion of the nickel then occurs with consequent slot widening and increased sugar content of the final molasses. Distortion of chrome nickel screens over the backing screen also results in increased slot widths.

In an effort to reduce these losses, the Bureau of Sugar Experiment Stations (BSES Australia) approached the Commonwealth Scientific and Industrial Research Organisation (CSIRO Australia) in 1986 to see whether screens could be produced from stainless steel by laser cutting techniques.

Preliminary results indicated:

1. The new (lasercut) screens handle as high a massecuite rate as the chrome nickel screens.
2. The lasercut screens equal the purging efficiency of the chrome nickel screens at normal throughput.
3. The average purity rise from cyclone to final molasses is approximately 0.75 units lower with the new screens , representing an increase in recovery of some 0.15 units.

The technology was licenced by CSIRO and the BSES to ActionLaser Pty Ltd, a company specifically established to produce such fine slotted lasercut screens. Commercial production commenced in June 1989. Lasercut screens were used by 29 of 30 Australian mills during the 1990 campaign with many mills using them exclusively. Lasercut screens have now been sold in 15 countries including the USA.

The durability of the lasercut screens supplied in 1990 has been confirmed by examination of the screens before and after 2000 hours of operation. The wear on the stainless steel screens is much less and distortion of the screen into the backing screen has been virtually eliminated, even in the massecuite impact zone. Barring mechanical damage, these screens have been shown to last in excess of two thousand hours.

The presentation will describe some of the recent test results obtained around the world. Information will also be presented on screen wear mechanisms and their reduction using lasercut screens. A cost benefit analysis of lasercut and chrome nickel screens along with discussion of screen issues of particular relevance to the USA beet sugar industry will also be included.

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