

Five Derrick® Stack Sizer® machines improve platinum and chrome production in South Africa

- US\$4.0m project payback in seven months
- Doubled chrome recovery, improved PGM recovery
- Reduced flotation reagent consumption

Background

A major platinum producer in South Africa was looking to improve production of platinum and chrome from the platinum reef. The platinum reef is commonly referred to as UG2, a relatively common, but complex, ore body that outcrops in both the east and west of the Northern Province, commonly referred to as the greater Rustenburg/Thabazimbi region and the Steelpoort region, respectively. The complexity of the UG2 reef is largely attributed to the presence of significant chrome minerals in the reef. As the particle size of the quartz carrying PGM's and the Chrome mineral are similar it complicates the separation process, particularly in closed circuit mills with cyclone classification.



5-Deck Stack Sizers installed in early 2012

Solution

During 2011, testing was carried out in Buffalo to determine the efficiency of replacing the platinum producer's secondary mill hydrocyclones with Stack Sizers. The incumbent metallurgical manager travelled to Buffalo to participate in, and direct, the test work.

Following the successful testing, the company designed an innovative flow sheet to optimize the following parameters:

1. Increase platinum recovery.
2. Remove chrome prior to flotation.
3. Reduce circulation load through the mill.

The customer decided to install five 5-Deck Stack Sizer® machines in early 2012, at a total capital investment of about US\$4.0m. The equipment consisted of an 850 micron unit, a 200 micron unit, and three 100 micron machines. The three 100 micron

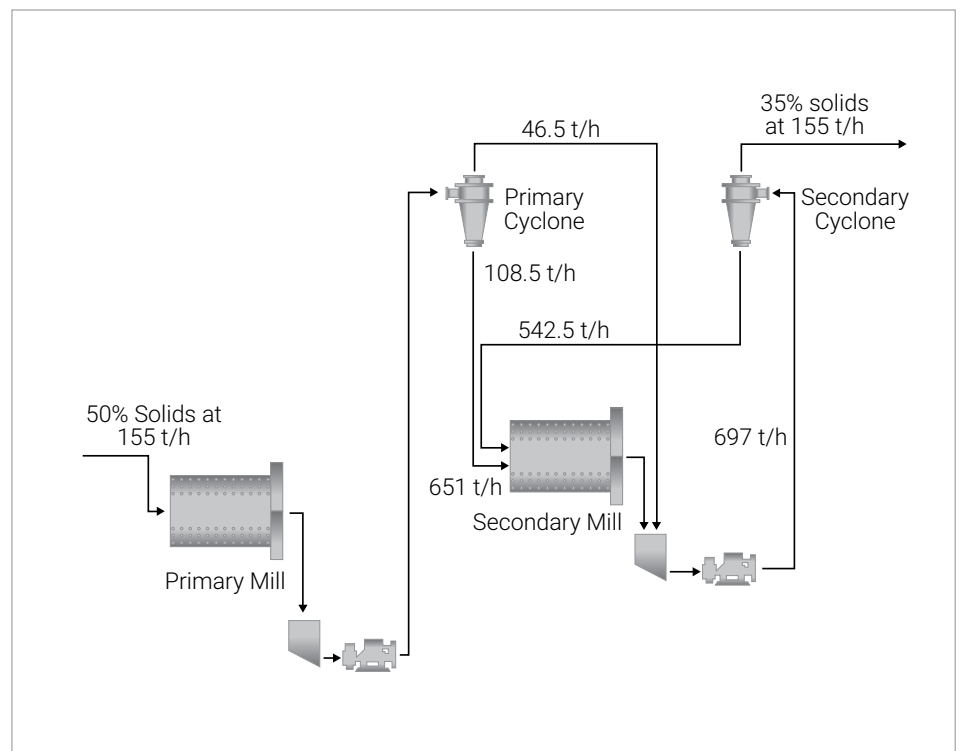
Stack Sizers were commissioned first, and dramatic results were achieved immediately!

The coarse chrome fraction, a saleable product, doubled in production! The company had to increase the size of the spiral plant to cope with this large increase in chrome. Platinum recovery increased significantly, and the payback for the US\$4.0m investment was less than seven months!

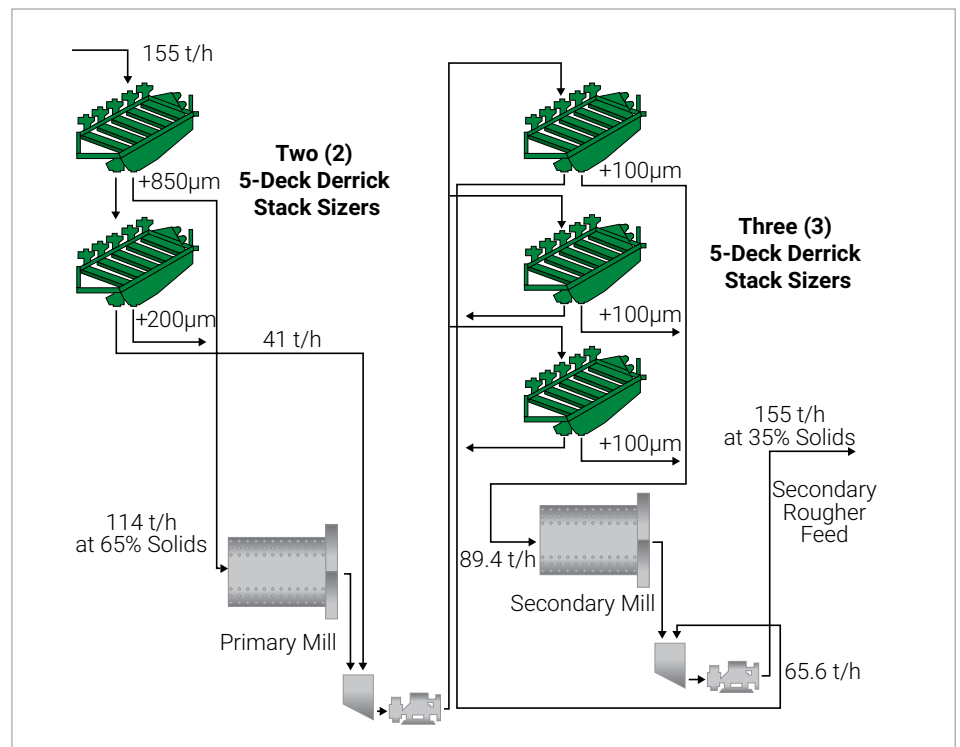
One negative aspect was the presence of wood fibers from underground support structures that do not pass easily through the urethane panels. The company currently employs manual labor to gently brush the panels on a scheduled basis, but the longer term solution is to fit a linear screen with coarse belt to remove the fibrous material before the feed flows to the Stack Sizers.

Conclusion

Although process data has not been received, the customer has expressed complete satisfaction with their screens, which have resulted in a dramatic improvement in platinum recovery as well as doubling of their chrome production. The project was justified on the basis of increased Platinum Group Metals (PGM) recovery. The huge increase in chrome recovery was an added bonus!



Original flowsheet



New flowsheet

For more information, please contact your local Derrick sales representative.

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