

A Measurable Difference

J&L Fiber Services Product Case Study

SmartPlates™

Used in controlled trials to determine best plate pattern and optimum operating conditions

Purpose

To increase plate life by 16% and decrease energy consumption by 5%.

Mill Information

Location: Midwest
Paper Grade/Furnish: Lightweight and medium-weight coated papers
Position: Reject
Installed: 45SW112 SmartPlates
48SW134 SmartPlates

Trial Results

RA – Reject Single Disk Refiner

- Trial 1 SmartPlates were installed on August 4, 2003.
- Trial 2 SmartPlates were installed on November 19, 2003.
- Trial 3 SmartPlates were installed on February 17, 2004.
- Trial 4: SmartPlates were installed on May 20, 2004.
- Trial 1 and 2 plates are our equivalent to Durametal D52B062 pattern and have demonstrated comparable performance. Therefore the benefits achieved in this trial are attributed to controls through SmartPlates.
- Trial 3 and 4 plates are uni-directional (Stabilizer) plates.

Trial 1 and 2 plates

Position	Pattern	Alloy	Taper
Rotor	45SW112	C28	0.005"/"
Stator	45SW112	C28	0.005"/"

Trial 3 and 4 plates

Position	Pattern	Alloy	Taper
Rotor	45SW134	C28	5/1.5/10
Stator	45SW134	C28	5/1.5/10

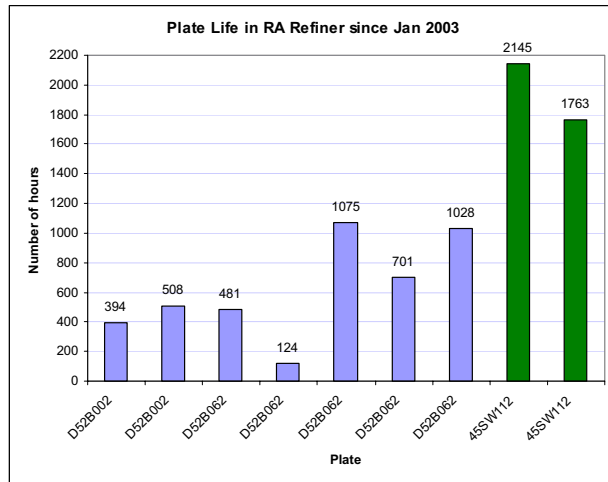
The plate life calculations are shown in the table below (*trial 3 plate hours not known at the time of writing this report.*)

	RA	RB
Baseline Average Life	616	1248
Best Three plate life from baseline	935	1376
Trial Life	1954	850
Best Three plate life from Trial - among equal # of plates in baseline	1954	1223
% Improvement since Jan 2003	217%	-32%
Best 3 comparison before and after trial	109%	-11%
Net Change	120%	

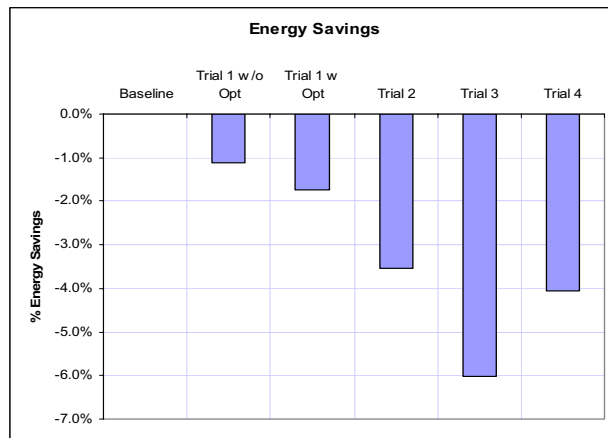
Overall, the plate life doubled because of the SP optimized controls. The reason for life increase is that through SmartPlates optimized controls we reduced the motor load variation. There is increased likelihood that the plates have a minor clash when the motor load is above 3.3 MW.

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The following figure shows the energy savings achieved during each of the J&L trials in RA refiner compared to the mill's standard plates. The first two bars are for the first trial, first with no process optimization and then with optimized operating conditions implemented. The energy savings are more significant with the uni-directional (Stabilizer) plates (trials 3 and 4). There were no adverse effects on pulp quality.



Conclusion

Based on the two full plate lives with 45SW112 SmartPlates and one full plate life with 48SW134 SmartPlates (second set of plates is running currently) RA Reject refiner (in comparison to Durametal DB52062) are achieving following results:

- The plate life increased by 120% against an objective of 16%
- Energy decrease by 6% (plate life average with 48SW134). This translates into \$60,000 per year savings at 355 days of operation. The objective was to reduce energy by 5%.
- Decreased motor load standard deviation by 79%.

Based on the motor load variation reduction, this refiner has a potential of increasing the throughput by 10-15%. If this production increase can be translated into the production increase of the total line, this will translate into additional \$400,000 savings per year by replacing the market pulp with self produced pulp.

With the help of SmartPlates, we were able to determine the best plate pattern and optimum operating conditions specific to this mill.