

Case Study II

Tegal 903 Nitride Etcher

Process and Machine Problems

A line of multiple Tegal 901/903 machines runs various processes, such as Nitride, VIA, Etchback, whereby the yields are very low and the overall performance is inadequate, mainly as a result of poor end-point monitoring. In addition, the machines on the line are limited to run non-critical etch tasks only.

The customer defined the problem as "...Chronic non-uniform etch problem...Generates significant amount of scrap..."

The table below shows the loss in a single month per one machine:

Cost of scrapped wafers -	300 wafers/month @ \$300/wafer	\$90,000
20% slow operation -	4800 wafers/month @ \$2/wafer	\$9600
Extra engineering work -	100 hours/month @ \$100/hour	\$10,000
Cost of test wafers -	1 per lot, 600 wafers/month @ \$20/wafer	\$12,000
Use of metrology equipment -	30 hours/month @ \$500/hour	\$15,000
Limited to simple processes, lost time of other equipment, etc.		??????
Total one month loss		> \$136,600

The TadiVac Solutions

TadiVac was installed for evaluation on one machine (out of the entire line). The results were revolutionary. TadiVac2000 could easily, and accurately, detect the occurrence of the end-point and halt the process precisely at the right time. The scraps, tests, slow operation, extra engineering etc., were eliminated.

In addition, the machine's overall performance has been increased as a result of full monitoring, diagnostics, better-planned maintenance, and more.

Ultimate Results

- Savings of multi million dollars each month (on multiple machines).
- Tegal machines that were considered old and slow have been totally revived with high yields, very high utilization, and prolonged life.
- Purchase of new machines was eliminated due to these process steps.
- Major capital investment was saved, all thanks to the TadiVac2000.

Over-All Fab Yield, Capacity And Profitability Were Increased !