

Bottle Orienter – The R&D time line:

1. October 2006. Designed concept machine.
2. November 2006. Built a test rig.
3. November 2006. Ordered bottle orienter based on successful trial of test rig.
4. January 2007. Installed bottle orienter onto S1.
5. February 2007. Noted excessive belt temperature and wear. Re-designed belt backing plates and continued to run. Zero cost in re-design. Belt cost of approx. \$4k.
6. March 2007. Again noted excessive belt wear after a period of 5 weeks of running. Again, re-designed belt backing plates and continued to run. Re-design cost of \$7k. Belt cost of \$4k.
7. April 2007. We did some in-house modifications that were unsuccessful and consequently deteriorated the performance of the machine.
8. May 2007. Fixed in-house modifications properly. Cost of re-fit \$3k. Cost of belts \$8k.
9. August 2007. We installed a bottle counter in order to better plan the preventative maintenance and replacement program for belts. Performance of rotator is exceptional, see downtime chart.

Total initial cost of project approx. \$100k. Total cost of re-designs: \$10k. Cost of belts broken in learning curve \$16k.

