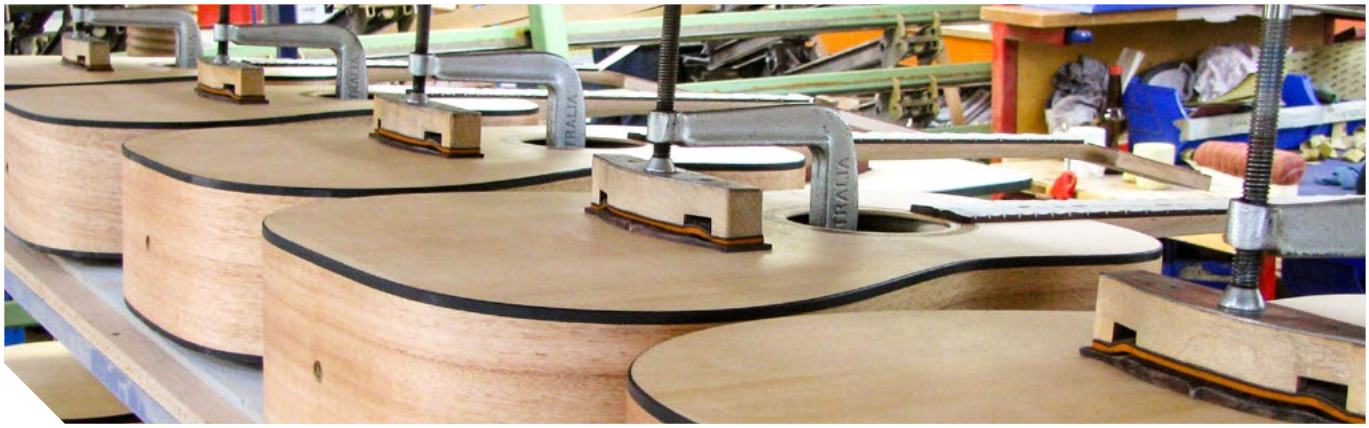

CASE STUDY

Maton Guitars

A comprehensive resource assessment of Maton's guitar making operations has been the catalyst for actions that have increased material yields by up to 60%, reduced cost of managing waste by 50% and significantly boosted productivity.

Business snapshot

Maton, located in Box Hill, Melbourne, has an international reputation for the manufacture of premium acoustic and electric guitars and ukuleles. Approaching its 70th year of operation, still 100% owned and run by the founder Bill May's family, Maton has gained acceptance on the world stage as a producer of instruments of the highest quality, marketed in North America, Europe, China and Japan.

Specialising in making stringed instruments from Australian timbers, Maton guitars are being played by world leading Australian artists including Tommy Emmanuel, Keith Urban, John Butler, Colin Hay and Shane Howard. Elvis Presley, George Harrison and Keith Richards have also played a Maton guitar.

Understanding material usage

Maton had identified the need to reduce the cost of its materials as being a crucial element for the business to remain a competitive, locally-based manufacturing operation. In an attempt to reduce these purchase costs, Maton had previously undertaken a waste audit and a review of major material procurement costs with key suppliers. A review of the business by Enterprise Connect identified the need for improved stock control. Following this, Maton also undertook a value stream mapping exercise to better understand its resource usage.

Having made a strategic decision to manufacture all solid-timber guitars using locally sourced Australian timber to replace plywood guitars, Maton realised it had an increasing level of wastage of expensive, quality timber. Maton engaged a consultant in 2014, to undertake a comprehensive resource assessment of all aspects of its operations funded in part by a $15,000 grant from Sustainability Victoria.

The objective of the assessment was to review the current waste streams and main value adding processes of its operations - from input raw materials to finished product - and to quantify and better understand all material consumption and losses in each process step. While the focus was on raw material inputs, the assessment also considered other resources including packaging, water, energy inputs and outputs, and trade waste emissions.

"Having an external set of eyes work with us over a number of months to map our value adding processes and quantify the Total Cost of Material Waste has meant the assessment became a catalyst for change across the organisation that has boosted both material efficiency and productivity" said Maton General Manager, David Steedman.

Opportunities for efficiency

The assessment, completed at the end of 2014, found that Maton's material spend was between 25-35% of its operating costs, and that due to the high value of raw materials, the ratio of the purchase price to the cost of disposal of waste was 15 to 1, meaning the waste material cost 15 times more to purchase than to dispose of. Even more eye opening was that while the material cost of rejected components was in excess of $1,000 per week, the true cost of reject material, once labour and energy costs were added in, was almost 48 times the cost of disposal.

A number of key recommendations were made for improving overall resource efficiency, involving optimising materials use, improved measuring, monitoring and reporting, and workplace improvements. The annual savings when all actions are implemented is estimated at more than $55,000 per year, plus a productivity boost worth more than $100,000 per year. The total cost to implement all these changes was estimated at less than $20,000 (excluding capital project costs) which equates to a pay-back period of less than 12 months on workplace improvement activities.

Understanding the what, why and when of its waste

Since the assessment, Maton has embarked on an ambitious plan to implement all recommendations. Optimising materials use and reducing wastage was the key focus area. However for Maton, 70% of the materials used in manufacturing the guitars have fixed purchase prices and are mostly purchased as assembled, finished components (machine heads, pickup system, strings, cases, etc.), leaving little or no room for material efficiency improvements. Maton therefore concentrated on the 30% of materials, mainly expensive timbers and purchased bulk quantity materials, where there were opportunities for increasing efficiencies.

All rejected timber was tracked and measured for several weeks, to determine what was being rejected and why, and what could be reused or value added. For example, rejected premium grade faces can be reused to make components or smaller bodied instruments such as a mini guitar or a ukulele. The 'real cost of waste' approach permitted Maton to understand all costs associated with rejecting components and products that are near or at completion, preferring to find faults earlier and avoid waste of additional labour, handling and energy costs.

Ambitious course of actions to optimise materials use and reduce waste

One of the first actions arising was to look at ways of improving the accuracy of cutting and assembly thereby reducing process wastage, overproduction and rework mainly caused by errors. Various tools used for measuring and cutting timber such as jigs, gauges and clamps were purchased. Maton received a grant of $3,000 from Sustainability Victoria to cover some of the implementation costs for these measures. Process errors have been reduced by 80% which is expected to save Maton about $25,000 per annum in materials costs alone.

A detailed analysis combining the raw material cost with compounding conversion costs as materials progress through each production stage from timber drying, cutting and CNC machining to body building, assembly and painting was fundamental to the assessment. For example, timber used to make a guitar neck passes through more than 20 value-adding steps. Each step was mapped and the value of a component may be 5 times greater than the material cost before it is assembled onto a finished guitar.

A workplace project was undertaken to capture the type and quantities of components rejected at each value-adding stage. A communication process has been implemented to involve all guitar builders to identify and quarantine material faults early in the process rather than when a whole guitar was nearing completion.

For example, a timber knot in a guitar neck that may reduce the strength of the neck, might pass through to a finishing stage before making the decision to reject it, resulting in the 'write-off' of a guitar worth several thousands of dollars, for a component worth less than tens of dollars. The internal 'Quality Alert' system is paying dividends with the team now getting feedback and becoming more confident to make early rejection calls themselves, rather than leaving it for someone else further along the value-adding process.

The commitment to invest in a European precision-made, multi-blade frame saw for cutting thin timber components, mainly backs and sides, has had a huge impact on timber yield and productivity. This Australian first was installed in mid-2015. The new saw not only cuts more back and side sets from a timber billet in a single pass, but only 1 or 2 additional passes through a belt sander is required, compared to 5 to 8 previous passes. Both the new saw and sander run for less time which has also resulted in energy savings, a significant reduction in saw dust and further energy savings due to less operation of dust extractors, and less saw dust removal costs.

Understanding wastage pays dividends

While the focus has been on avoiding waste and optimising material efficiency, Maton is managing unavoidable waste streams more effectively as well. The total cost of waste management per guitar has been halved. Timber offcuts are reused by local woodworking and craft groups, metal is separated from land-fill, and even used guitar strings from the repair and restoration shop are being collected for a local sculptor.

Maton's efficiency actions stemming from the initial resource assessment has increased cut timber material yields by up to 60%, reduced waste management costs by 50%, boosted productivity, saved a significant amount of energy, improved worker safety and resulted in positive staff behaviour changes.

"We have learned to see where the avoidable material waste and non-value adding costs are in our business and have used this approach as the focus to implementing a range of activities that will ultimately improve the overall performance of our whole business."

Anthony Knowles, Operations Manager

Sustainability Victoria
Level 28, Urban Workshop,
50 Lonsdale Street, Melbourne VIC 3000
Phone (03) 8626 8700
sustainability.vic.gov.au

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