Research Information
5/2004

May 2004

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Avoiding landfill through effective wood waste disposal & a shift in product focus

Timber Waste Management Case Study – Joinery

The achievement

Input Joinery is a privately owned company that has gone from strength to strength over the last 25 years. Originally a small operation established in 1979 the company has moved site twice and employs over 55 people with a turnover of approximately £3 million in 2003. However, with the expansion of the business has come an increase in wood waste output. Initially the company produced levels of wood chip waste that could be dealt with by Vero Poultry (a poultry bedding company). This saved Input Joinery £3,840 (per year) on the cost of disposing of waste via skip removal. Higher volumes of waste continued to be produced as the business grew, which prompted the management to install a wood fuelled boiler. As a result of

installing the boiler Input Joinery saved a further £12,960 on the cost of disposal via Vero Poultry and £8-10,000 on the cost of heating.

Key management issues

- Evaluating most cost effective disposal routes for timber waste and taking action appropriate for the size of the business – local fuel use, container disposal or in-house boiler
- Cost, benefit and payback assessment of installing a wood fuelled boiler – recovering the investment through cost savings on disposal
- Material efficiency – importing laminated timber and utilising engineered wood products which are becoming more readily available to the market through companies such as Timbmet Ltd.

Key benefits

- Factory site heated 24hours a day 7 days a week, producing an annual saving of £8–10,000 on the cost of traditional gas and oil heating
- Greatly reduced landfill/waste disposal costs incurred through skip or wood chip extraction disposal with potential savings of up to £24,000 per annum
- Large wood waste, time and money savings in the manufacturing process through shifting focus to laminated timber and engineered wood products.

Background

Input Joinery dealt with its wood waste problem effectively during each stage of business growth, minimising landfill and making significant financial savings. Their established mechanism for disposing of wood chip involved extraction to a large container, which was removed from site by a poultry bedding company free of charge. This gradually became unfeasible, and a move to a wood fired boiler was required as the business grew. The investment in an automated boiler system was justified by the financial savings on the cost of skip disposal and heating which would more than recover the cost within 7-8 years.

The company continues to seek methods to further improve waste economy, and is currently shifting its product focus by using engineered wood components and laminated timber as raw material. The defect-free nature of engineered lumber facilitates waste efficient manufacture of a number of Input Joinery products. Doors can be made with just 5% waste generated compared to the 15 – 20% waste generated by manufacture from conventional timbers.

The wood waste problem

As Input Joinery developed and moved to larger sites, higher volumes of waste were produced due to higher production levels and wider product ranges. Increased wood chip waste had to be removed through extraction to a large container. However, containers had to be exchanged regularly and when this took place the extraction units had to be shut down. Without extraction, production had to stop and this came at a cost of man-hours lost. A further problem of increased production levels was the larger volume of materials rejected during manufacture due to quality, warping, knots or other reasons. These rejections not only produced more waste but were also costly to replace as value had already been added.

Effective wood waste disposal

When the company expanded (moving to its second site) waste became a more important issue, with the potential costs of disposal increasing considerably due to the higher volumes being produced. 90% of all waste produced was timber related, approximately ¾ of this consisting of wood chip and ¼ solid waste. A negligible amount of the solid waste was disposed of via skips, but the majority was given away to the public and staff as fuel wood or to reuse. Wood chip was extracted and disposed of by a chicken bedding company at no charge. Although this wood chip disposal was free, there was a cost in terms of labour time lost during extraction. This was because the factory had to shut down twice a month to exchange the wood chip disposal container. Animal bedding and chipboard manufacturing companies are often willing to remove wood chip waste at no cost if there is a large enough volume of predominantly softwood chip. Poultry bedding can include much higher levels of hardwood chip, ideal for Input Joinery who worked with a chicken bedding company to dispose of their waste. When taking into account the cost of lost labour time this method of wood chip disposal saved the company £3,840 on the cost of skip disposal.

At the current site on the Fairground Industrial estate, where the company has been situated since 2002 the proportions of timber waste disposed are similar. The total volume of wood waste output increased with the larger site and higher levels of throughput. This, when combined with more expensive skip rates (particularly for active waste such as timber) raised the potential annual skip cost to £20,160. The chicken bedding disposal route would still produce large savings (£7,200) but costing approximately £12,960 in lost labour time each year. Changes had to be made, and the management made the decision to invest in a German automatic self-feeding wood fired boiler system. Skips were no longer required for any timber waste and the boiler eliminated the need for factory shutdown time. It also provided 24 hour water and factory heating which saved a £8-10,000 per annum on gas and oil heating. The investment in the system should recover its own value within 7-8 years.

Disposal Method	**Unit costs**	**Monthly Cost**	**Annual Cost**
Waste company / skips	£100/skip x 2/week	£800	£9,600
Poultry bedding	12hrs x £20/hr x 2/month	£480	£5,760
		Annual Saving	**£3,840**

Change in product focus

Input Joinery has always tried to be as environmentally sound and economically efficient as possible regarding the materials it uses and the waste it produces. The company is currently changing its focus, from more traditional softwood (pine) and hardwood (sapele and oak) products to laminated softwood, hardwood and engineered wood products. Using these raw materials has produced waste savings in many stages of the production process and through reduced levels of final product rejection. Input Joinery has estimated the waste levels produced in making a pair of doors or set of windows from more traditional materials and from laminated materials:

	Pine	Laminated pine	Softwood waste saving	Sapele	Laminated sapele	Hardwood waste saving
Doors:	15-20%	5%	10-15%	20-30%	5%	15-25%
Windows:	10-15%	5%	5-10%	15-20%	5%	10-15%

In door production there is the potential to reduce waste by 10 –15% when substituting laminated softwood for traditional softwood. Using engineered hardwood lumber in place of traditional rough sawn hardwood could save 15-25% of waste. In addition to these direct waste savings, there is cost saving throughout the production process as it takes less time and material to produce each unit. The table below gives an indication of how waste, materials and labour savings are made:

Material / Waste Saving	Labour Saving
Material is already the correct dimensions, so there is no cutting or re-sawing to size	Very little time spent cutting
No defects in material, which means no rejection when selecting material for use	No time spent treating knots and defects
No spend on defect / knot treatment materials	No time wasted re-manufacturing products that are rejected
No rejections during the production process as there is no warping/distortion or defects	No time wasted producing the same item a second time as a replacement
No rejection of final product on site as structural stability is superior and resilient to temperature and humidity changes	Fewer stages in the production process saves time in completing products

The author of this sheet is employed by TRADA Technology Ltd, managers for the project. The work was carried out under a contract jointly funded by the Timber Research and Development Association and the Secretary of State for Trade and Industry. This document is published with the consent of the Department of Trade and Industry, but the views expressed are not necessarily endorsed or accepted by the Department.

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