

ERGONOMICS DEMONSTRATION PROJECT

Pacific Crest Industries Inc.

December, 2002



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Introduction

Pacific Crest Industries is a manufacturer of Pacific Crest and Ridgeline wood cabinets in Kent, Washington. The company was founded in 1988 and has been successfully expanding its operations. Cabinets are frameless and built using European cabinet manufacturing as a model.

Pacific Crest has developed a model material handling system for transporting material and product through the process using roller conveyors. The process was laid out by a consultant in 1990 and has been expanded since. The equipment installation and much of the fabrication was performed by Pacific Crest. The impetus for installing the conveyor system was efficiency, but it has had the added benefit of putting the work at a comfortable working level and reducing the risk of musculoskeletal injuries from lifting and carrying heavy material. The conveyor system is not perfect, and is being improved upon during the company's current expansion, but it does reduce material handling and can lower certain jobs from Hazard Zone lifting levels to the Caution Zone.

Process Description

The cabinet making operation at Pacific Crest is a mostly linear production process, with buffers between departments for inventory. Material is stored in horizontal racks and moved onto a roller conveyor either by forklift or by two-person lift teams. Material is then moved to the panel saw, where it is cut into cabinet components. After cutting, pieces are moved to the banding machine to place wood bands along visible edges. Material is then moved on the roller conveyors to boring, where holes are drilled and dowels are inserted by machine. Face pieces are moved to finishing where they are sanded and finished by spraying individual pieces in spray booths. All pieces for each order are then moved to assembly, where the cabinets are assembled on a roller conveyor line. Cabinets are palletized and wrapped at the end of the line for shipping.

Ergonomic Controls

Pacific Crest has implemented several solutions to control potential Hazard Zone lifting. The roller conveyor system is a control that eliminates lifting throughout the production process. Several workstations would have possible Hazard Zone lifting required in the work activities without the installed interventions. The following descriptions give brief summaries of the controls that have been implemented across the company and in individual work areas.

Roller Conveyor System

Hazard Zone Risk Factor Addressed: Heavy, Frequent and Awkward Lifting

Many material moving tasks have been removed by the installation of a roller conveyor system that transports material into and out of each work area from the raw material storage to shipping. Cabinet components are placed on small pallets or in vertical shelves that are pushed on the conveyors. A segment of roller conveyor on angle-iron rails is used as a transfer cart between each department. Material can be pushed from each machine onto the transfer cart, which is then pushed down the rails to meet up with an appropriate roller conveyor. The components are then pushed onto the roller conveyors for the next department.

Push-pull forces are still required to move material and should not be ignored as a possible source of injury. However, pushing and pulling is not covered and does not need to be evaluated under the Washington State Ergonomics Rule. The roller conveyor process does eliminate some heavy lifting and much of the possible frequent lifting that otherwise could make lifting a Hazard Zone risk factor in many areas of the operation.



Figure 1. Roller conveyor system and roller transfer cart moving material in and out of the panel saw and the edge banding machines.

Panel Saw

Hazard Zone Risk Factor Addressed: Heavy, Frequent and Awkward Lifting

The first area on the production line is the panel saw. Large sheets of wood weighing over 100 lbs. are pushed off of a stack onto the panel saw table. The sheets are moved on rollers on the table to perform the cuts. Cut pieces are pushed on the table onto a roller conveyor transfer cart.

The installation and design of rollers, roller conveyors and a scissor-lift table has eliminated most of the heavy lifting associated with this work area. The stack of wood has been placed on a roller conveyor, which conveys the wood onto a scissor-lift table. The scissor-lift table is adjusted so that pieces of wood can be pushed over a roller onto

the panel saw. The wood can be pushed on the panel saw table rollers to perform cuts and then onto the roller conveyor transfer cart when finished.



Figure 2. Panel saw workstation with scissor-lift for uncut wood shown on the left and transfer conveyor for finished wood shown in the foreground.

Conclusion

Pacific Crest has developed a material handling system that can minimize frequent and heavy lifting of material and cabinet components. Hazard Zone lifting tasks were eliminated at several stations. Improvements are ongoing during a company expansion and include mechanical lifting aids for palletizing and vertical storage of all in-process cabinet components.

The roller conveyor system makes it possible to move work through the assembly process and store it in a buffer with minimal lifting. Most lifting that does occur is done at a comfortable height between knee and waist level, and involves material weighing 80 lbs or less. Once renovations are final, the roller conveyor and material handling system should be a model process.

Pacific Crest has manufactured cabinets using a process designed for efficiency. Elimination of heavy lifting, frequent awkward movements and injury reductions are part of the company's efficiency and quality improvements. Pacific Crest has chosen a consistent strategy for reducing unnecessary and unsafe lifting from among several possible alternatives. This production process put into place by Pacific Crest has helped eliminate possible Hazard Zone tasks and reduce the risk of musculoskeletal injuries.