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QA & Fabrication



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Manufacturing Case Study—



The C5 Compact Express runs 40 hours per week and often is performing lights out production for jobs running as long as 16 – 20 hours. Lead times that were 10-12 weeks are now 2-3 weeks.

Fighting China and Aging Equipment

An Aging Manufacturer Gets a New Lease on Life with a 5 Compact Express.

When Bob Wilson founded King Electric Mfg. Company, Seattle, WA, in 1958 in a 9,500-square-foot facility with three employees, he outsourced all the sheet metal fabrication and concentrated on assembly and sales of a single product line—baseboard heating units.

Through the years, the company thrived and evolved into a full-line heater manufacturer with such product lines as residential fan heaters, architectural grade fan heaters, electrical furnaces, radiant convection heaters, and commercial unit heaters. King Electric's market area has expanded throughout the U.S., Canada, and South America, selling through electrical distributors such as Graybar and retailers such as Lowe's. Today, King Electric is housed in a facility with 100,000 square feet and 110 employees. And the company now fabricates its own sheet metal parts.

Bob Wilson's son Dean rejoined the family business in

2006 after pursuing career experiences with other corporations and earning an MBA in Technology. While King Electric has a proud history of success, at that time the company was facing two major challenges: Low-cost competition from China, and even more threatening, an emerging customer service backlog created by old fabricating equipment and outdated manufacturing strategies and techniques.

Problem: China and Old Equipment

In 2006, King Electric took a hard look the competitive pressures in the marketplace that were beginning to adversely affect their operation.

"Many of our competitors were starting to import their products from China," explains Dean Wilson, executive vice president of manufacturing. "We had to find a solution in order to compete."

Wilson took a two-week industry tour of China and

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Dean Wilson (left) and Bob Wilson chose the C5 Compact Express to combat the competitive pressures in the marketplace from China that were beginning to adversely affect their operation and also to modernize their outdated fabrication equipment.

spoke to many Chinese manufacturers, trying to determine if there were benefits to giving up his company's manufacturing operation and begin importing its products from China.

Wilson also began evaluating an alternate strategy for modernizing and automating his existing facility.

"I wanted to select our new manufacturing strategy before we selected the equipment," says Wilson. "I believe that lean manufacturing comes down to two words – *eliminate waste.*"

At the time, King Electric's metalworking equipment consisted of hard tool punch presses, press brakes, and old mechanical turret punch presses.

"One of our problems was that we were a batch run oriented shop," says Wilson.

Example: If King Electric had 500 heaters to make, there would be several different batch operations in progress to complete the job. The process lacked coordination in each batch operation. In some cases 500 parts were made; in other areas 5,000 parts were produced.

"There were often part shortages in one stage of production and surpluses in another," reflects Wilson. "This resulted in bottlenecks that translated into long lead times and an increasing number of frustrated customers."

The old mechanical turret punch press that was in use could not utilize the latest nesting software or advanced tooling on the market, resulting in wasted steps of production.

"We started purchasing pre-sheared blanks, but now we were paying a premium for our steel," says Wilson. "We had nearly 35 different sizes of pre-sheared blanks at various areas throughout the shop. We were wasting production time and money by the process of shear, punch, and shear the part out. We had work in process (WIP) all over the shop floor, and we were paying a premium for the pre-sheared blanks. In addition, we were outsourcing \$250,000 to job shops in order to keep up with our production demands."

Finding a Solution

In searching for a new turret punch press, Wilson was looking for a machine that could utilize advanced tooling and software. After an extensive search, King Electric chose the C5 Compact Express from Finn-Power, which adds unmanned operation to the C5 turret punch press through highly compact load/unload automation. The unit's loading /unloading solution utilizes the space above and below the machine, requiring only slightly more space than a turret punch press. It is fast, with simultaneous loading and unloading during processing, accurate, yet does not limit easy manual operation.

On the Finn-Power C5, King Electric is able to make these louvers in a single operation on a nested sheet, which allows the company to produce 24 parts on a 4' x 8' sheet, reducing the cost from \$9/grille to \$3/grille.



The 20-station, 33-ton C5 hydraulic turret punch press has a maximum sheet capacity of 50" x 100" and is available with either Siemens or Fanuc controls.

Tooling flexibility is important to King Electric. Up to 10 auto-index and Multi-Tool® holders may be installed in a Finn-Power turret. King Electric has five auto-index stations, three upforming stations, and three Multi-Tool stations in the C5. Unique to the C5 turret punch press, full tonnage indexable upforming allows complex forming operations to be made quickly by using a single forming tool.

Upforming

One of the key parts to King Electric's manufacturing operation is the ability to make louvers.

"Many of the louvers that we form are bent to a full 90 degrees, because we want to get the least resistance of air



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flow, with the hot air coming out of the heater. This creates a very high form," explains Wilson. "We form louvers up to 3/8" high."

Finn-Power's upforming feature provides a precise process for knock-outs, louvers, and other forming. Finn-Power resolved the conventional problem of the die height impeding free sheet movement. Finn-Power's design allows forming heights up to 16 mm (0.62"), with the forms made by the die moving upwards and then retracting, allowing completely free sheet movement, eliminating scratched or jammed sheets.

"We had a high-volume part with a difficult louver that was important for us," says Wilson. "Finn-Power and Wilson Tool International were able to give us a 4-3/4" length louver in a standard 3-1/2" station by doing custom machine work on a tool holder. This flexibility is one of the reasons we chose the Finn-Power machine."

Before and After

One challenging part for King Electric was a grille which has a louver at 54° for the intake air and a louver at 90° for discharge air. The punch height of the tool on the old mechanical turret could not be changed so this was a 2-step operation.

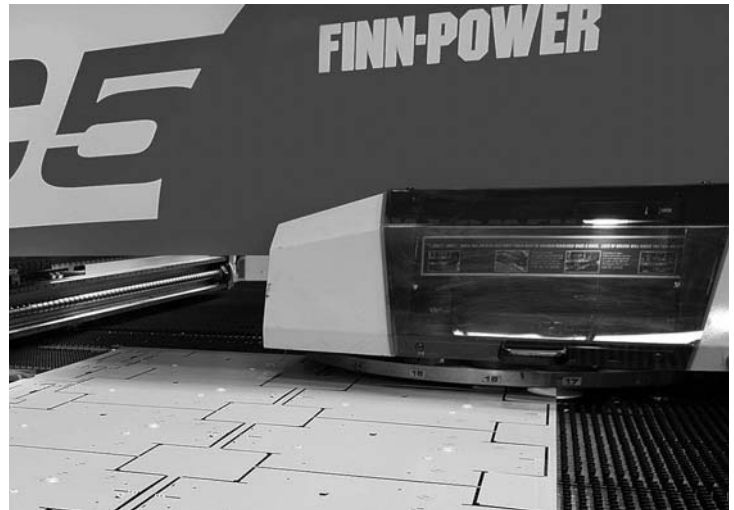
"We could only punch at 54 degrees," says Wilson. "We then took the grille to another mechanical punch press that had a set of dies that allowed us to take them to 90 degrees."

On the Finn-Power C5, King Electric is able to make these louvers in a single operation on a nested sheet, which allows the company to produce 24 parts on a 4' x 8' sheet. Before the C5, these parts were produced one at a time. With the C5's automated loader, the company is able to accomplish all of this with no operator labor and no load/unload labor. "With the old method of production, our cost was \$9/grille," continues Wilson.

"With Finn-Power, our cost is \$3/grille. We make 60,000 of these parts a year. In addition, the C5 Express has allowed us to bring all of the \$250,000 outsourcing to job shops back in-house. That was a plus to the bottom line from the first day the C5 Express was installed. The first programs that I wrote were for the outsourced parts."

According to King Electric, the Finn-Power C5 Compact Express has created a different way of thinking and a different philosophy in running the shop.

"There has been a culture change in our company," says Wilson. "We are moving forward, and the benefits are becoming more obvious every day. Our material utilization has increased dramatically to approximately 85%. The full sized sheets we run negate the premium for pre-sheared blanks. Common line cutting helps with that material utilization and cuts down on the amount of scrap and skeletons. We no longer have WIP inventory all over the shop floor. When we run



500 heaters, all the matching parts are coming off the machine together. This creates an efficient work flow throughout our factory."

Lights Out Manufacturing

The C5 Compact Express runs 40 hours per week and often is performing lights out production for jobs running as long as 16 – 20 hours. Wilson has the C5 Compact Express hooked up with a web cam so that he can monitor the machine at night.

"The C5 has become a mechanism that allows us maintain control over our factory operations," he says. "Now when we quote a lead time to a customer, we meet it. Lead times that were 10 – 12 weeks are now 2 – 3 weeks. Today, we are almost building to order. We are producing in real time. There is a lot of predictability. It certainly takes out a lot of stress for our managers."

Revolutionized Operations

Wilson believes that the C5 Compact Express has revolutionized his company's manufacturing operations.

"The Finn-Power machine has accelerated our technology by 30 years," he says

Wilson identifies other key benefits as:

Eliminating secondary operations and getting more work off the turret. "We can use the Wilson rolling shear, rib, and offset – which were normally press brake operations – and the rolling wheel allows us to cut out large circles...without having to nibble that out, which takes a long time.

- Welding time has been cut by 40-50% due to the C5's precision and accuracy.
- 25% savings in assembly.
- 30% savings in raw material
- \$250,000 savings from elimination of outsourcing.
- Payback on the machine will be one to 1-1/2 years.

"I've seen a lot of added benefits that weren't on my mind when we first bought the C5 Compact Express," Wilson says. "This machine has helped implement a culture change within King Electric. Without this machine, we couldn't have done it. It has removed a lot of barriers and allowed us to implement modern manufacturing strategies." ■