

# Custom Demands Require Fabrication Flexibility

Peerless Electric custom-builds about 60 percent of its lighting products. A newly installed turret punch press and shear combo, along with automated complex-bending capability, reduces time needed to manufacture these tricky parts by 60 percent while saving material and manpower.

Peerless Electric Co. Ltd., Montreal, Quebec, Canada, specializes in the manufacture and supply of lighting fixtures for the commercial, industrial and institutional markets. It punches, bends and paints metal parts, then assembles them for a customer base that is 90-percent Canadian. Since its creation in 1939, change has been constant at Peerless, and today, increased competition combined with the requirement for shorter lead times for custom product lines, has

created an urgent need to closely analyze and modify the company's manufacturing operations.

"The bidding process and manufacturing realities of the lighting industry changed dramatically in the 1990s," explains Barry Fagen, Peerless vice president. "Approximately 60 percent of the products we manufacture are custom made and do not appear in our catalog.

This combination turret punch press and shear produces exact finished blanks at Peerless Electric, destined for further forming into custom light fixtures. Use of the machine and its automatic loading/unloading capability has upped productivity and slashed waste, reducing total manufacturing time by 60 percent while cutting scrap generation by 11 percent.



When we receive a bid for lighting, we immediately work with engineers and architects to design products that will provide the proper lighting in the most energy-efficient manner. In prior years, we may have had a year to produce our products and meet delivery dates. Today, lead times are more like six to eight weeks."

Faced with those shrinking lead times for complex parts, the company recently went active in its search for new ways to produce, namely more flexible sheetmetal-fabricating equipment. Productivity at Peerless had to improve.

"We would buy our sheetmetal cut to size or we'd shear it into blanks at our facility," explains Fagen. "We had two turret punch presses and would feed each sheet individually and then stack parts for secondary operations. The various levels of manual labor—shearing, loading, unloading, bending, etc.—made production slow and unpredictable. We had to become more flexible in our sheetmetal fabrication."

At the 2002 Euro-Blech trade show (Hannover, Germany), Fagen and operations manager Marcel Reweghs spied a hydraulic turret punch press with an integrated right-angle shear (the Shear



The combination turret press and right-angle shear provides a finished blank that undergoes press-brake forming or automatic bending to yield a light fixture.

Genius), arranged as a flexible manufacturing cell, at the Finn-Power booth. They saw it as a means to turn full-sized sheet into finished parts on one space-saving machine. Fagen purchased it and had it installed in March 2003.

## Less Space, More Productivity

The Peerless-Montreal facility encompasses 150,000 sq. ft. and boasts 70 production employees, the majority on first shift. Five employees handle second-shift production. Constantly looking to provide shorter lead times for customers, Peerless has embraced automation, with the Shear Genius being the latest example.

In a cell format at Peerless, the Shear Genius performs automated blank loading, punching, forming, part unloading, sorting and stacking. In doing that, according to Finn-Power officials, it provides minimal setup times and offers lights-out operation, and can increase material productivity through nesting programs.

Peerless primarily uses cold-rolled steel to produce its light fixtures—22-gauge for fixture bodies and 24-gauge for reflectors. Typical blank sizes are 34 by 60 in., 22 by 58 in., and 34 by 58 in. Work begins as part programming downloads to the machine and a fork-lift places sheet bundles onto two loading tables, where the sheets are picked up individually by the Shear Genius loading equipment and placed on the machine table.

The clamped sheets, automatically squared, feed to the turret and the shear, with finished blanks guided to one of five stacking centers according to the part program. Conveyors transport punch and shear scrap to containers and lift trucks remove finished flat blanks, ready for bending on other equipment. The Shear Genius also has forming and specialized upforming capability in heights to 0.63 in., which Peerless plans to incorporate in future production.

During one job, the operator prepares the next, nearly eliminating setup time. The machine produces large blanks during attended shifts and smaller parts during unattended shifts—midnight to 7 a.m. Monday through Friday and all day Saturday and Sunday.

On average, according to Peerless officials, the machine reduces total manufacturing time by 60 percent while cutting scrap generation by 11 percent compared to production prior to the equipment buy.

In addition, use of the machine has cut previously needed secondary operations such as deburring through the integrated right-angle shear that eliminates nibble edges on part exteriors. Another plus: the cell occupies six to seven times less floor space than the old process, primarily due to the need for various operation locations and accompanying staging areas.

Peerless makes use of four auto-index stations in producing parts on

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the Shear Genius. The machine's auto-index system rotates the punch and die in their tool holders using one AC servo motor, eliminating the need to match up multiple servo motors in order for punch orientation to match that of the die. These components can be rotated in 0.001-deg. increments with total rotation beyond 360 deg. That flexibility allows for automatic selection of the shortest rotation path for a programmed angle.

The machine also incorporates an individual tool-holder concept, allowing Peerless to design its own turret layout—specific tool stations are not machined into the turret—that will accept any tooling style and as many as 10 auto-index, forming or Multi-Tool stations. Peerless has opted for eight-, 10- and 24-station Finn-Power Multi-Tool stations.

The Shear Genius operates three shifts, 24/7. To keep the cell running under this demanding schedule, Peerless makes proper tool and machine maintenance a top priority. Each Saturday, a maintenance mechanic, Quan Wang Yang, spends the morning sharpening tools and following prescribed maintenance procedures such as oiling, greasing and cleaning. He also removes punched slugs by hand.

“When using an air hose to dislodge the slugs,” explains Yang, “who knows where the slugs are scattered? By removing them by hand, I know they can do no damage to the machine.”

The dedication to preventive maintenance has paid off, as the Shear Genius has reached an uptime level of 94 percent, according to Fagen.

## Automated Bending Assists in JIT Manufacturing

Concurrent with the purchase of the turret-press cell, Peerless acquired the capability for automated loading and complex bending via a Finn-Power Express Bender. A robot loads the sheet—in thicknesses to 11 gauge—onto the worktable where a manipulator pushes against the positioning pins and holds the workpiece firmly during all manipulation phases. After automated bend-



**Automated loading and complex bending of light-fixture bodies is a reality at Peerless courtesy of this machine, a Finn-Power Express Bender. Its capability is exhibited in the fixture body held by Marcel Reweghs (left), Peerless operations manager, and Barry Fagen, vice president.**

ing, the part automatically exits to the operator, who performs final assembly by placing pop rivets and inserting smaller components. Finished fixture bodies, placed on pallets, then are transported for painting.

“We purchased the Shear Genius and Express Bender to facilitate our just-in-time production and eliminate the levels of work-in-process inventories,” says Fagen. “Today, we fabricate the majority of our custom products on the Shear Genius. Each month, we also form more products on the Express Bender.”

In addition to adding equipment, Peerless retrained its personnel to think outside the box. An example is redesigning products to make them more production-efficient while maintaining quality. Consider a fixture comprised of four basic elements: a body or channel, end covers, socket brackets and a ballast cover.



“Our Gymnasium (a Peerless fixture) line requires punching, bending and spot welding these parts together,” explains Fagen. “It had taken two employees a day to produce a total of 40 fixtures. By contrast, with the Shear Genius and Express Bender, we have redesigned the unit as one piece, allowing us to produce 120 units per eight-hour shift using only one employee.”

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*Information for this article was provided by Finn-Power International, Inc., Schaumburg, IL; tel. 847/885-3200; [www.finnpower.com](http://www.finnpower.com).*