

Empire Electronics expands domain to Honduras

A Tier 2 supplier's trek to an emerging market with a low-cost labor pool illustrates why companies opt to re-locate manufacturing operations. But in moving its Detroit area production work to one of Central America's most active industrial zones, a privately held company—now with more than \$50 million in annual sales—has built an empire on continuous improvement.

The turning point for **Empire Electronics** came in the mid-1990s while workers were making wire harnesses in the United States for America's best-selling passenger car. It was a steady revenue source until the income stream evaporated. Simply put, a competitor undercut price by having the assembly work done in Mexico.

"And that was my wake-up call," said Steven C. Doman, Chairman, CEO, and Owner of Empire Electronics, based in Troy, MI. Seeking to lower the firm's

labor costs, Empire executives traveled to India and Mexico. Mexico received the nod, and a down payment was put on a building. But after a lengthy conversation with a business colleague, Doman reconsidered the move. "It never felt comfortable," he said.

The Central American nation with 6.9 million residents became the new assembly hub for Empire in 1997. Business in San Pedro Sula started with two managers and 20 employees to assemble 20,000 wire harnesses a month in a plant of 17,000 ft² (1,580 m²). By 2005, the operation had grown to nine department heads, 80 bilingual engineers, and 1,400 laborers—all native Hondurans—to assemble 1.8 million parts a month in a facility of more than 200,000 ft² (18,580 m²).

Airbag, door module, sunroof, and lighting harnesses represent a smattering of the work done for more than 15 of the company's Tier 1 customers. Although



Assembly workers such as Norma Guerra (shown) must be at least 18 years old, must be able to read, and must go through color-blind testing as part of the hiring process at Empire Electronics' plant in Honduras.



Empire has moved beyond doing just wire harness assembly. Socket potting (shown) is one example of the company's many in-house capabilities.



Employee Santos Avila reaches for supplies in Empire's 6000-ft² (560-m²) warehouse in Honduras. The warehouse stocks enough raw materials to supply the plant for two weeks. There is a six-day lead-time for all products leaving Honduras for the U.S. and vice versa.



Empire Electronics owner, Chairman, and CEO Steven C. Doman has seen the company experience rapid growth in recent years. Current production vehicles that contain product assembled by Empire include the Chevrolet Cobalt and HHR, Chrysler PT Cruiser, Dodge Charger, Ford F-Series, Jeep Liberty, Saturn Vue, and Nissan Xterra.

establishing a production base in Honduras saved Empire from becoming another entry in the deceased supplier ledger, the private company's leaders are not content to remain a one-dimensional operation. "The reason we've been successful," said Plant Manager Alfredo Gabriele, "is because of doing assembly in a low-cost country; but that's not enough."

Management and assembly workers are fully aware that quality products are mandatory. "We started our operations in Honduras with the attitude and under-

standing that quality is the top priority," said Doman. "We have taken [the Toyota Production System], studied it, made it our own, and implemented it." Empire's continuous improvement mindset puts an accent on finding ways to streamline production. For example, each wire is simultaneously tested and measured as it is fabricated.

Empire's Honduras operations are also infused with in-house tooling capabilities for producing precise plastic injected-molded components such as connectors, fasteners, and grommets. Using computer tools, engineers design the molds that workers build for electrical connectors as well as for other plastic and rubber components. The plant's die room is stocked with more than 200 dies. "In 24 hours, we can make up to 16 set changes in one machine to change one terminal or the gauge of the wire," said Christian Alvarado, the plant's Process Manager.

In-house-developed computer software validates in real time that pieces are production-ready. Computers in the cutting-crimping area provide current information on quality, maintenance, materials, and downtime issues. The vast resources for monitoring quality and other production considerations, as well as the assortment of in-house tooling and equipment, underscore the company's drive to be self-sufficient. "We've started doing what most companies have stopped doing—and that's become vertically integrated," said Doman.

When Empire added socket-potting capability about three years ago, new business resulted. "In the industry, there are probably only three companies that do socket potting; and of those three companies, only one also does wire harness assembly. It's also rare to see plastic injection molding capability done in the same facility as wire harness assembly," said Gabriele. Empire's patent-pending socket-potting process differs from the traditional one-shot sealing process. "It's a very robust process that involves a two-shot cycle of shooting the potting material inside the socket," said Francisco Chavarria, plant Engineering Manager.

The process of producing 20,000 potted sockets a day—representing 14 different part numbers—is done in a temperature- and humidity-controlled room. Workers dispense a predetermined amount of liquid compound into fixtures. "The scrap from the molding machines is used to make a pallet's fixtures for the potting process," said Oscar Diaz, plant Lead Engineer. A conveyor system designed and built in-house allows the mixture to gel for 7 min before the potted sockets enter a 140°F (60°C) curing oven for 20 min. Instead of doing spec-only product, an in-house-designed potted socket reached production in the fourth quarter of 2005. "We developed our own socket to give a better price to the customer. It is also a more robust design," said Diaz.

Empire engineers, as well as plant workers, constantly look for ways to improve a process or a product. "We sometimes see things that are not the best way of having a product done," said Ana Ortiz, Advanced Product Quality Planning Manager. Empire designers and engineers frequently talk with their Tier 1 suppliers about ways to improve the design and/or processing of a product, and many times the exchanges lead to Empire assuming an active role in the up-front product development phase.

Even the labor-intensive job of assembling wire harnesses beckons innovative, out-of-the-box thinking. "For an engineer, you need a challenge. And with all these new manufacturing processes comes a learning experience and challenges, which is great," said Diaz. Being satisfied with staying the same is not

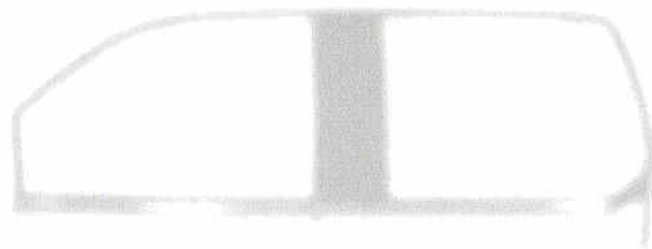
an option. "We don't like to copy and paste," Ortiz said. "We want to be different." And, Diaz added, "We think we can do it better."

Empire remains focused on continued growth and improvement. For instance, Michigan's 20-person engineering staff has designed eight prototype terminals. The unique terminals should enter production in 2006. Plans also are in the works for the company to form a joint venture in China for the production of electrical components, electric motors, and wire harnesses for the Chinese automotive market. Honduras workers likely will assist with assembly of product for the Chinese automotive market, "so we can give our customers a value-add package," said Gabriele.

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