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ETCO, with roots in Rhode Island and Florida, specializes in parts that make electrical connections for the automotive, appliance, and medical industries

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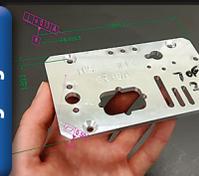
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Stamping Company Built Business Around Quality in High-Volume Markets

ETCO, with roots in Rhode Island and Florida, specializes in parts that make electrical connections for the automotive, appliance, and medical industries

ETCO Incorporated has been stamping precision metal parts since 1947. Today, with locations in Florida and Rhode Island, the firm meets the highest quality standards, including ISO 9001: 2015 and IATF 16949: 2016, as well as SAE J2031 and J2032 for automotive ignition cables.

According to ETCO Vice President of Marketing Sean Dunn, the company's priority is metal stamping of tight-tolerance, close-pitch, high-precision, and light-gauge metal components. Its capabilities are well-suited to serving high-volume markets that include automotive (OEMs and aftermarket), appliances, and medical products.

Multiple Metal Stamping Options

"ETCO has been working with OEM and Tier I, Tier 2, and Tier 3 suppliers since 1947," Dunn said in an emailed response. "We are a single-source solution for all electrical connections. Our in-house engineering department provides customers with a turnkey solution, including design development, rapid prototyping, production, and custom automated assembly machinery."

Over the years, ETCO has produced a wide range of parts. The company works primarily in automotive ignition components, wire harness terminals for appliances, and various custom stampings for numerous industries. Besides stamping parts for the automotive, appliance, and medical markets, ETCO stamps parts for aerospace, battery, construction, lighting, communications, and electronics applications. The company also makes parts for trucks, off-highway vehicles, HVAC equipment, and agricultural equipment, Dunn said.

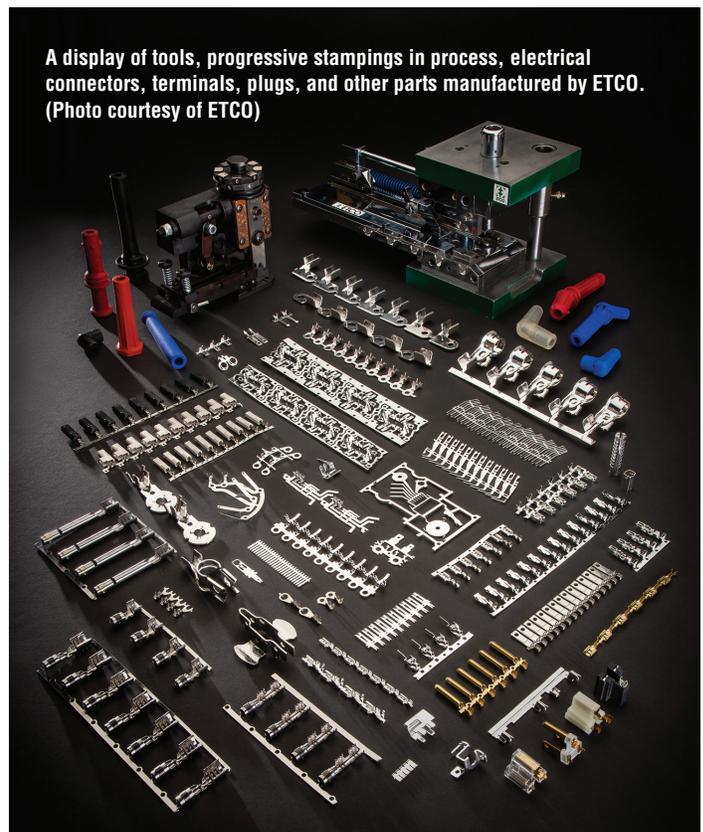
"ETCO can create multiple custom metal stamping options for a variety of industries because we are set up with flexibility in mind," he said. "We design, stamp, and ship with our customer's needs in mind. We service over 1,000 customers throughout the world, providing a range of custom stampings from reel-to-reel terminals to complex, large, loose-piece automotive frames."

ETCO's stamping equipment, the company's backbone, includes more than 20 high-speed Bruderer stamping presses that range in clamp force from 10 to 60 tons. The company also uses "normal and long stroke" presses, according to its website.

"Our precision metal stamping presses can accommodate multiple weights and tonnage," the company said on its website. "With speeds up to 1,500 per minute, no job is too large."

A Culture of Quality

As a custom precision metal stamper, ETCO uses a wide range of materials for its stamping projects. These include copper, bronze,



A display of tools, progressive stampings in process, electrical connectors, terminals, plugs, and other parts manufactured by ETCO. (Photo courtesy of ETCO)

stainless steel and copper, and cold-rolled steel, in thicknesses from 0.008 inch to 0.075 inch. The company can also stamp aluminum, brass, nickel-plated steel, stainless steel, and various high performance copper alloys. ETCO does not use lead-based materials or materials that are harmful to the environment, according to its website.

"ETCO's custom metal stamping is done with quality as a primary consideration. If we cannot provide metal stamping to exact specifications and without exact tolerances, we will not take the job," Dunn said. He added that ETCO's engineers and quality experts are constantly looking to stay ahead of the industry curve as they strive to maintain the highest manufacturing quality.

"We maintain ISO certification and/or IATF certification for most of our processes because they are the highest standards available. We hold all our employees to high standards in regard to individual manufacturing and quality certifications," he said.

ETCO's facilities in Warwick, Rhode Island (North Plant) and Bradenton, Florida (South Plant) are both certified to ISO 9001:2015 and the automotive industry's quality management system standard, IATF 16949:2016. The company has equipped its metal stamping operations for in-process inspection with CpK analysis. It also uses press-mounted vision systems, Dunn said.

"We have vision systems on ETCO's equipment, which measure all parts and materials. Presses are automatically shut down if a part is out of spec," he said.

ETCO's emphasis on quality is reflected in a cultural change that it has undergone over the years, based on the Philip Crosby Quality Management Methodologies.

"Crosby's Zero Defects concept says, 'Do things right the first time.' It is never cheaper to do something over, or to do it inefficiently or inconsistently for the company or the customer," ETCO said on its website. "At ETCO, the concept Zero Defects and Continuous Improvement is an integral part of the business and an ongoing effort. All ETCO employees receive training based on the philosophy and quality system developed by Philip Crosby."

ETCO's employees are involved in this effort via Quality Work Groups (QWGs), which grew out of the Crosby System Quality Improvement Team. ETCO's management staff meets "at scheduled intervals to continually improve a broad scope of the company's processes," according to its website.

"These groups are a spinoff of the Crosby System's Quality Improvement Team and have proven to be effective tools in our process. As a result, the improvement process becomes more than just common sense—it becomes common practice," ETCO said on its website.

Despite a national shortage of tool and die workers, ETCO maintains a strong tool and die shop that manufactures all of its own dies to high quality standards.

"All of our dies and tools are engineered in-house to maintain tight tolerances from a wide range of alloys in a variety of configurations, from 0.008-inch to 0.070-inch thick, with tolerances to +0.002-inch," Dunn said. "With state-of-the-art EDM and CNC machines, our expert die makers make high quality tools. We work closely with our customers to ensure the most cost-effective material, plating, and packaging is selected for their product needs."

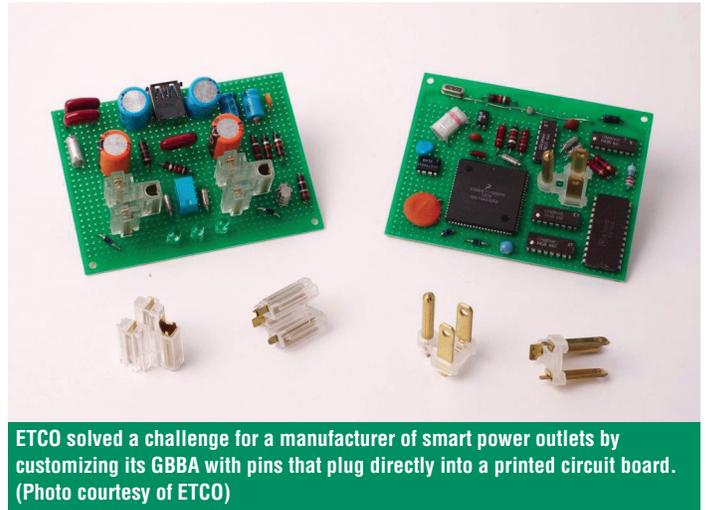
ETCO's biggest strength, Dunn said, is its 74 years of experience—in manufacturing and emphasizing excellent customer service, superior quality products, and on-time delivery. That experience enables ETCO to take a customer's project through engineering and manufacturing, and then provide the equipment to attach the part to wire.

Automated Assembly Assistance

ETCO offers customers help with automated assembly by designing and manufacturing custom assembly equipment to perform secondary operations on stamped products in strip form. Multiple functions can be performed, including bending, brazing, welding, crimping, cutting, inserting, and attaching additional components. For example, a design for fully programmable equipment capable of 3,000 pieces per hour could present stamped metal lead frames from a reel, press fit them onto ceramic insulators, and attach and terminate wire leads.

Making Connections with Electrical Parts

ETCO manufactures ignition components in stainless steel, nickel-plated steel, zinc-plated steel, and brass. These ignition components can be found in automobiles, trucks, motorcycles, RVs, off-road



ETCO solved a challenge for a manufacturer of smart power outlets by customizing its GBBA with pins that plug directly into a printed circuit board. (Photo courtesy of ETCO)

vehicles, watercraft, and farm and lawn equipment, ETCO said on its website. The company has also manufactured vibration-resistant spark plug terminals that are said to have been a staple on the NASCAR circuit and the choice of top professional drivers around the world. The terminals have a tempered spring clip, which provides a tactile feel when pushed onto a spark plug and seats, and is said to ensure a reliable connection.

To address supply chain shortages, ETCO recently introduced a line of U.S.-made battery terminals, ignition terminals, and other connector types that are available to OEMs as a single SKU to simplify purchase and inspection, the company said in a release. The Standby and Portable Generator Terminal Products include top post battery terminals that are lead-free and RoHS compliant. They also include locking ring terminals and serrated rings, ignition and spark plug terminals with high retention clips, and insulated terminals.

According to ETCO, the products are supplied either "loose" or in strip form for automated processing equipment. Most of the products feature an F-Crimp for a "more secure connection than conventional rollover style flag ears, and permit faster automated wire processing speeds with less fracturing, better wire deformation, and a more distinct bellmouth," the company said in the release.

The company also released a broad line of locking ring terminals that are reported to be "ideally suited" for use in automation equipment—including robotic arms and pick-and-place equipment—because of their oversized teeth and reliable F-crimp design. "Four teeth on each terminal bite into metal and anchor the terminal to help prevent unwanted rotation during assembly, handling, and operation, which can cause arcing or an electrical short with adjacent terminals," ETCO said in a release.

The locking ring terminals are offered in tinned-brass, plain brass, and stainless steel. They attach to 12-22 gauge wire using an F-crimp for a more secure connection than conventional flag ears, the company said.

A Custom Solution with Far-Ranging Applications

In one example of its ability to solve a technical challenge, ETCO developed a solution for a manufacturer of smart power outlets. It involved ETCO's GBBA product—short for ground, blade, bridge assembly. The assembly has a ground pin, two blades, and a "bridge," or plastic piece, that holds them together, with the correct spacing, for use in a standard U.S. AC wall socket.

Traditionally, the assembly works as the end of an extension cord.



Custom-designed progressive die electrical connectors, locking rings, hook rings, in-line disconnects, and other stampings manufactured by ETCO Incorporated. (Photo courtesy of ETCO)

But ETCO took the business end of the part—the two blades and the pin—and devised a way to connect it to a printed circuit board (PCB), instead of crimping it to wire. Power is transferred through the PCB, while components specific to data on the board enable users to control their devices remotely.

ETCO accomplished this by removing the ear sections on its GBBA and FAE, and replacing them with pins that plug directly into a PCB. The pins are then soldered in place. Applications for this development are far-ranging, Dunn said, and are relevant to manufacturers of smart outlets, battery chargers, medical devices, and extension cords, to name a few.

“Customers are developing smart devices that use a PC board to control functions that are plugged into an AC outlet,” Dunn said. “There is no crimping involved. The part is inserted into a PC board and then soldered to the board. The board is then put into a housing for the device.”

The method also applies to the FAE, Dunn said. “ETCO is taking the business end of the receptacles, surrounding them with a housing, and making them able to be assembled to and soldered to a printed circuit board. Again, no wires—the assembly is soldered to the PCB. It helps the manufacturer at the OEM level because both parts can be assembled quicker, and it reduces the chance of errors.”

ETCO’s part helps speed up the assembly of the cords because all three of the wires can be crimped at one time using the company’s applicators. ■

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