Turning the corner on making doors

North Carolina company streamlines process

Figure 1
A safety door on the forming mechanism protects operators using the machine. A foot pedal controls the machine, which will not work unless the door is shut completely.

By Linda Baldwin

While some fabricators feel the pinch of today's tightening economy, a small fabricator in North Carolina has remained optimistic.

"Production is our restriction. We have many opportunities in the market. If we can produce more, the demand is there," said Jim Austin, president of The Austin Company, Yadkinville, N.C.

The family-owned company manufactures standard and custom electrical enclosures for the commercial construction industry and a growing number of OEMs. The company has doubled its sales and size in the last 10 years.

Although electrical enclosures are in high demand, the low unemployment rate in Yadkinville and the surrounding area has followed the national downward trend, forcing Austin to rethink the company's production process.

"With a short supply of qualified workers, we've investigated other ways to increase throughput. We came to a point where automation was necessary to keep up with demand," Austin said. "We've been careful to invest in equipment that will quickly reduce costs and increase production."

Most enclosures made by the company include doors constructed similarly to a shoebox lid. When analyzing where the next investment would be made, Austin noted the labor-intensive fabrication of these doors.

Figure 2
Austin's former can produce corners with radii of up to 4 in. The thickness of the materials can range from 8 to 22 ga. Bend-up height depends on material thickness and bend radius.

"The metal for the lid is sheared, the corners are notched, and the four sides are bent. The next two steps, manually welding and sanding the seams, were time-consuming. Welding and grinding are an art; there are inconsistencies in these steps," Austin said.

While corners were labor-intensive and results acceptable but inconsistent, Austin said he had not identified them as a production problem until he saw a routine sales presentation for a new product.

"Once we saw it, we made a trip to New Jersey to see a corner-forming machine," he said. "We also sent samples of our own product so we could see how it would work for us."

Austin said he had two criteria for bringing a corner former into his operation: It should reduce the labor involved in making and finishing corners, and it should produce a more uniform door flange.

"I wasn't aware of anyone else who made a machine that would do this, so once it met my criteria, we brought it in," he said. He purchased CIMID's ACF Multiflex automatic corner former.

"It makes uniform corners in three steps instead of five," he said. "It was the next logical step in automating our production."

Forming Door Corners

In the new process, operators form a part using standard press brake procedures, except for the bottom V die. They machine a relief on the bottom V die for the left side and the right side of the part. This relief produces a flare at the corner, instead of a 90-degree angle. They then take the part to the corner former and place it on top of a base block that has the same radius as the press brake and the expected corner.

In its turn, the corner former pulls extra material below the edge of the panel side. This material, which the machine shears off immediately after forming, is the difference between the maximum bend-up height and the minimum bend-up height. The machine then repeats this process for the remaining three corners.

"The corner former has substantially reduced labor costs associated with fabricating doors," Austin said. "The same operator does the bending and the corner forming in about one minute per part. Now we can shift employees to ease welding and grinding bottlenecks in other areas of the company."

In addition, corner forming eliminates the need for stacking to weld and restacking to grind. The part does not need to be transported to the welding department and then again to the grinding department. Operators move the part once to the corner former.

"The sheets for doors and tops of metal junction boxes can be very large. Material handling is a big issue," Austin said. "Increasing throughput and controlling labor costs have resulted from moving parts as little as possible. Using a corner former has also reduced material costs since there are no abrasives or welding supplies needed."

While the corner former increases production, it is also safer than the traditional welding and grinding processes. A safety door on the forming mechanism protects operators using the machine. A foot pedal controls

the machine (see **Figure 1**), which will not work unless the door is shut completely. In addition, corner forming eliminates welding fumes, grinding dust, and the noise from grinding.

Forming Options

Austin's former can produce corners with radii of up to 4 in. The thickness of the materials can range from 8 to 22 ga. Bend-up heights depend on material thickness and bend radii (see **Figure 2**). His machine can handle corners with multiple bend heights, reverse or return flanges, and bull noses.

Because enclosures are mostly of the familiar shoebox lid configuration, Austin's corner former gives him the option to consider other markets in the future, such as trays, furniture, shelving, oven doors, food service equipment, traffic signs, all types of covers—anything that has sheet metal corners that are welded and ground.

The corner former has no limitations on the size of the panels it can accept, because only the corner is placed into the machine.

Using a corner former has given Austin flexibility in operating his production line. With one set of tooling, his operators can form four different thicknesses of material in all alloys and in all bend-up heights. Changing tooling to accommodate different radii takes them five minutes, according to Austin.

"This technology has streamlined our door fabricating process," Austin said. "Growing our business undoubtedly means future investments in other automated equipment." ■

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CIMID Corporation offers automated and CNC machines, systems, and lines for metal cutting, forming, grinding, polishing, and deburring applications.

Figure 1 photo courtesy of The Austin Co., Yadkinville, S.C. Figure 2 photo courtesy of CIMID Corp., Orange, N.J.

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