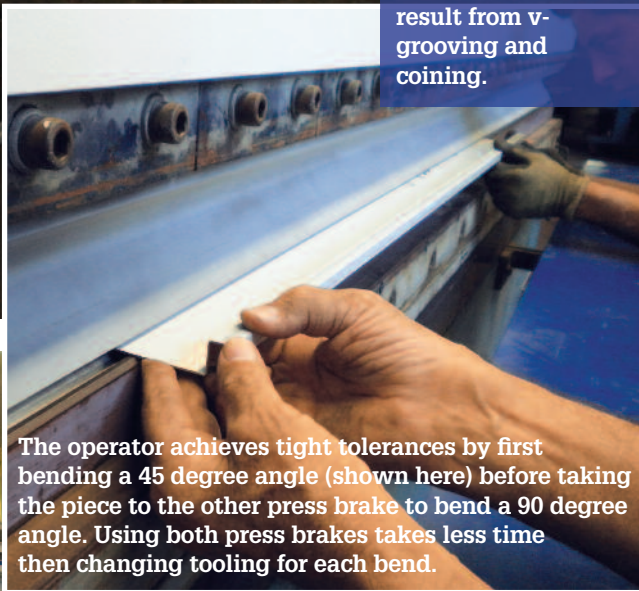




Super 8 mirror polish stainless steel, for use at a Louis Vuitton store in San Juan, Puerto Rico, shows the sharp corners that result from v-grooving and coining.



The operator achieves tight tolerances by first bending a 45 degree angle (shown here) before taking the piece to the other press brake to bend a 90 degree angle. Using both press brakes takes less time then changing tooling for each bend.



Phoenix Metalworks uses its unique process to create custom cabinetry for a Prada store in Las Vegas.

SHARP CORNERS

Fabricator combines an innovative process with press brakes to unlock the retail market

Tucked in Cat Springs, Texas, Phoenix Metalworks LP doesn't have a website and the company's phone number is unlisted. Business is conducted by word-of-mouth. But that doesn't concern owner John Huckaby. His company fabricates for the likes of Prada, Jimmy Choo and Christian Dior, creating custom metal structures used in these and other high-end storefronts.

The small job shop has developed a

niche market for architectural and ornamental metalwork that has kept it busy even during the downturn. Huckaby's breakthrough development of v-grooving for thicker metals like stainless steel unlocked the market for Phoenix Metalworks. To perform the nearly impossible bend profiles the jobs require and support short turnaround times, he depends on a pair of press brakes from Haco-Atlantic Inc., Houston.

"I held my first piece of Alucobond in 1972," says Huckaby. "I thought, 'This

could be the answer to some problems in sheet metal fabrication,'" he says. A type of lightweight composite material with two pre-finished 0.02-in.-thick aluminum cover sheets laminated to a polyethylene plastic core, the material can be grooved on the back with a table saw or router, sent to a job site and hand bent to fit different applications. "Every architect and designer in the world wants thick metal with sharp corners, but an effective fabrication method didn't exist," Huckaby says. Metal had to be welded, ground, sanded and re-polished in a process that could take weeks to complete, making it impractical for retail market deadlines.

Continuous bends

Huckaby created a technique for achieving sharp corners he calls v-grooving and coining. The process takes minutes and can be performed with stainless steel up to 3/4-in. thick at high speeds. When the company landed a contract to clad stainless steel over aluminum extrusions for an Alabama-based retail storefront group, Huckaby needed a press brake with more tonnage. "I also

Press Brakes

needed to be able to run continuous dies up to 12 ft. long since most storefronts are more than 10 ft. tall," he says.

"I purchased the 12-ft., 165-ton Haco-Atlantic Hydro Mechanical press brake with a CNC control because it was a cost-effective, reliable choice that permitted manual control of the ram and accommodated custom tooling." According to Huckaby, many press brakes are sold with European precision-style segmented tooling that must be stacked to bend a long part. "We deal in Super 8 mirror polish stainless steel, and the segmented tooling tends to mark the metal," he says.

Haco-Atlantic builds state-of-the-art fabricating equipment that includes press brakes, shears, plasmas, punch machines and ironworkers. "I have one, two and three-day turnaround times," says Huckaby. "If I have an issue, Haco-Atlantic responds immediately. Their technicians have even walked me through some things over the phone to get me going again quickly. You don't typically find that level of service with other suppliers. We operate these press brakes 10 hours a day, five days a week. The machines have to run no matter what, and they have never let me down."

Huckaby purchased a second press brake, a 14-ft., 200-ton Synchronmaster with a CNC control, from Haco-Atlantic in 2004. The fabricator needed a longer bed size to produce 12-ft. pieces of unblemished framing in 14-gauge cold-rolled steel ready for a patina finish. The framing was used for decorative windows and doors for construction of a third tower at the Bellagio, Las Vegas. "I needed to be able to bend 12-ft. pieces in a continuous mode without interruption," Huckaby says.

In addition to fabricating storefronts, Phoenix Metalwork's business includes metal profiles for different types of fixtures and custom cabinetry. Working with aluminum, brass and mirror polish stainless steel 20 gauge to 1/4-in. thick, material is sheared and v-grooved then heads to one of the press brakes for coining. "We coin bend all our products because we can achieve a sharper radius than air bending," Huckaby says. The high-precision bending method uses the press brake's top tool to force material into the bottom die with five to 30 times the force of air bending,

causing permanent deformation through the sheet. Because metal is formed to the shape of the die, there is little, if any, springback. "If a customer can draw it, we can bend it," says Huckaby.

One profile calls for six bends in stainless steel sheared 6 in. wide. A dovetail gauge bar that spans the distance between the press brake's side frames allows gauge fingers to be positioned manually along its length. The operator holds the metal close to the die and creeps the ram until the material makes contact with the die before allowing the machine to take over and perform the bend angle.

Phoenix Metalworks achieves return on investment for small or one-part production with the Synchronmaster's programmable CNC backgauge. "We may only make one part for a job or 20 parts," Huckaby says. "We have to be able to be profitable with that one part yet get it right the first time. The programmable CNC backgauge is a must."

The backgauge can be computer-controlled to allow the operator to make a series of bends in a component to a high degree of accuracy. The backgauge controls the backstop as well as the position and angle of the stop. "We use a fast DC servo-driven backstop on our machines," says Daniel Kint, sales manager for Haco-Atlantic. "The motor is equipped with an optical encoder to ensure very high positioning accuracy (0.004 in.)."

Bending large parts

Phoenix Metalworks also uses the press brakes to create a cell that employs both machines to produce single parts requiring multiple processes or different dies. When producing the 3-ft.-long door handles used for Jimmy Choo, the fabricator bends 12-gauge mirror polish stainless steel on the 14-ft. press brake using the increment depth stop and ram tilt adjustment.

"Ram parallelism and depth is maintained by a dual system that ensures extreme accuracies," Kint says. "Linear scales mounted at both ends of the bed help reference ram positioning from a dedicated



The 14-ft., 200-ton Haco-Atlantic Synchronmaster allows Phoenix Metalworks to bend 12-ft. pieces of material in a continuous mode.

'zero' or reference point on each scale, allowing for quick set up of repeat jobs."

Once the part is coined, the operator must continuously weld back plates onto the part, a process that warps the metal. The fabricator uses the 12 ft. press to straighten the part following welding.

When using multiple dies, the operator is able to save time by loading the press brakes with the different dies. "We perform a bend profile for Prada that specifies 12-gauge mirror polish stainless steel coined into a 40 mm by 40 mm post 12 ft. long with a pocket designed to contain 1/2-in. glass," says Huckaby. "The parts have to look like they have been machined from solid stainless steel bar stock. There are no welds on the outside of the profile. We shear the metal, v-groove it and coin a portion of the part on the 14 ft. press brake then complete the bend on the 12 ft. machine."

Whether a store opens on time depends on Phoenix Metalwork's ability to support production. The fabricator credits the press brakes and his employees with helping him meet unrealistic deadlines that have become commonplace. "I was raised in a sheet metal shop," says Huckaby. "I love coming up with new ideas. We have so much work we have trouble finding people to take on the specialized jobs we do. I wish more young people had an interest in the trade. I would like to pass on what I've learned to others."

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