



Standard row and column nesting maximizes the number of parts that fit on the plate.

CUTTING A NICHE

Working with thick materials requires equipment with specific capabilities, but not every company has the means to tackle the challenge. Houston-based Sabre Alloys LP has established itself as a shop capable of handling cutting jobs other fabricators cannot.

Sabre Alloys' core customers are fabricators, machine shops, sheet metal shops and large OEMs often serving the chemical and petrochemical markets in the Gulf Coast region of the United States. To fulfill its clients' needs, the company keeps thick materials in its inventory. Sabre Alloys is a steel service center specializing in heavy stainless steel plate, "which by nature makes us a job shop," says Matt Keith, president of Sabre Alloys.

In its shop, the company works with materials 1/8 in. thick up to 6 1/4 in. thick that are not readily available elsewhere, Keith says. "There is a fair portion of our

Sabre Alloys tackles thick material with its plasma cutting equipment

business that has the need or the demand for thicker material, and there is less competition on the thicker materials, especially in some of the niche grades we carry," he says.

Sabre Alloys provides semi-finished and finished plate products, custom shapes, machined discs and rings as well as bar, sheet, angle, flat beams and channels. It uses high-definition plasma cutting for up to 2 1/2-in.-thick stainless plate and conventional plasma cutting for plate up to 6 1/4 in. thick.

Quality and consistency

Some challenges Sabre Alloys found while cutting thick materials included holding

tighter tolerances, poor quality of cut, inconsistent cut quality from part to part and clean up on the parts, according to Keith. To meet increasing demand from customers, Sabre Alloys looked to Houston-based OEM Plasma Systems Inc. Plasma Systems uses components from Hypertherm Inc., Hanover, N.H., in its equipment to offer customers a complete CNC-controlled plasma cutting system. Components include the controller, torch height control and plasma power supply.

Plasma Systems' all-encompassing machine, the Cutting Edge III, has led to "comments [regarding the] quality [of] products compared to others doing the same thing," says Keith, adding the

Plasma Technology

actual cut quality coming from this piece of machinery is far better in all regards for all thicknesses.

The company also can accomplish more with less. “Historically, it’s taken two or three different machines to do what this single machine can do,” Keith says. “We’re saving shop space by introducing a single piece of equipment that fills all our requirements.”

When compared to Sabre Alloys’ last machine, the Cutting Edge III “has increased our capacity from 4½ in. thick to 6¼-in.-thick stainless, allowing us to take on that segment of the market,” Keith says. The machine enables the company to achieve tighter tolerances and cleaner cuts, “which saves the customer machine time and tool life,” Keith says. Improvements to ease operation for employees, faster cutting speeds and quicker changeovers have helped Sabre Alloys improve productivity for its thick-material-cutting needs.

Sabre Alloys’ switch to the Cutting Edge III eliminated the problems the company had because of lost time, mistakes or the need to recut materials when training new operators, according to Keith. The company also no longer has to take time changing consumables from lighter-gauge cutting to heavier material. The time involved in cleaning up heavy-gauge parts before shipping can be allocated elsewhere for other more productive tasks.

Integrated process

Often, using multiple machines to manufacture parts can result in inconsistent quality, accuracy or timing. To remove the inefficiency of too many hands stirring the pot, Plasma Systems decided to offer a plasma cutter that would consolidate the jobs of multiple machines.

“To automate and allow for better productivity, we as a manufacturer try to automate the process through software, taking it out of the operator’s hands,” says Rick Keeton, president of Plasma Systems.

Reliability and robust structural design are prime concerns for Sabre Alloys. “This is the first time in our history where the controller actually has the graphics to prompt the operator for consumables changes,” Keith says. “The computer



Left: A worker measures a stainless steel ring for use at a petrochemical facility.

Right: Built-in charts for automatically setting process parameters for mild steel, stainless and aluminum enable precise cutting performance.

makes all the changes with power supply and gas controls automatically. The operator deals with the CNC controller directly.”

The software works closely with the CNC control to ensure the cutting parameters are set correctly for the material and parts being cut. “The operator lines up the plate and presses the start button, making the machine easier to use, more productive—the operator isn’t out there spending an hour programming,” Keeton says.

Plasma Systems uses an AGMA 9 helical gear rack on the cross axis. “The angled teeth engage more gradually than do spur gear teeth, causing them to run more smoothly and quietly,” Keeton says. This makes machines able to handle larger loads and provide greater accuracy.

The company’s gear boxes, for example, have 1½ to 3 arc minutes of backlash, Keeton says. “They’re good for 10,000 hours with no maintenance—that’s a long time,” he says. “These gear boxes are more expensive, but they are very dependable and coupled with AC servo drives that have an industry-best frequency response of 1.6 kHz. The end result is a machine with a lot of accuracy.”

Plasma Systems powder coats the machine frames instead of painting,

providing greater durability. “The cross axis on the machine is a precision aluminum extrusion” with hardened raceways, Keeton says. “You get a customer that once in a while takes 20,000 lbs. or 40,000 lbs. of plate and, while positioning the material on the table, hits the front of the machine. A lot of manufacturers use a welded bridge that needs to be machined, which if you hit, you will need to replace the entire bridge.” Instead, Plasma Systems’ bridge is replaceable, “just like our end trucks, fabricated from ¾-in. plate on the top and sides, the bottom is ¼-in. plate—not often seen on a lot of machines. It’s just heavier duty,” Keeton says.

Sabre Alloys continues to mark its presence as the company that is able to meet stainless plate and processing demand in the industry. “[It] is our niche, where we focus our energy and financing,” Keith says. “We’re looking forward to continued growth.”

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