

Low cost air plasma system transforms steel fabricator

African Fusion visits the fabrication facilities of Tsipe Engineering near Rosslyn in Pretoria North and talks to the company's MD, Martin Krebs, about his investment in a Torchmate 4800 air plasma cutting system from Lincoln Electric distributor Cosmo Automation Solutions, a purchase that has transformed the sustainability and service potential of his SME.



Martin Krebs (right) with Cosmo Automation's Pierre Theunissen at Tsipe Engineering in Pretoria North.

“Our name, Tsipe, is derived from the Sesotho word for steel, tsepe. When it came to registering the company name, however, it was already taken, so we named it Tsipe instead. We started out in 1996 as a light fabricator of steel furniture for restaurants and local lodges and officially registered as Tsipe Engineering in 2002,” Krebs tells *African Fusion*.

“We then drifted into heavier steel and, today, we are back doing mostly light fabrication work. Here in our factory, we manufacture steel staircases and mezzanine floors which we then install onsite. We currently also have a contract to fabricate 4 000 handgun safes for the security industry and this is part of a 2-year repeat tender with total potential volumes of as many as 13 000 units,” he continues.

The work is cyclic and, at times, Tsipe has as many as 70 people working in its fabrication facility and onsite. “We have always strived to offer total fabrication, starting with our own designs. I use AutoCAD and, from the product design detail I use nesting routines to produce plate cutting plans that can be taken directly to CNC plasma, laser or waterjet cutting machines.

“We have a decent bending brake to form the flat components, then we do our own weld assembly painting and finishing,” says Krebs, adding that he also has machining facilities for heavier engineering work, such as vibrating screens, grizzly and pan feeders.

“Until last year, I was outsourcing my plate cutting to specialists with high-definition plasma cutting systems. Not only does this cost money, but outsourcing impacts delivery times and service levels. Many cutting shops won't deliver, so the correct material has to be carefully marked up and taken to the shop. Then the job has to wait until the machine is available and, if the job does not fill an entire sheet, the shop may also wait for a 'fill-in' job to enable their total job costs to be reduced.

“This, I found, was frustrating. It introduced uncertainty into every job and prevented me from reacting quickly to requests. If a customer wanted a staircase fitted on Friday and they ordered it on Monday, there was no way I could do it,” he explains.

The search for a cutting solution

Martin Krebs therefore went looking for an in-house cutting solution and met Pierre Theunissen at the Electra Mining show at Nasrec in 2016. “At that time, Pierre was representing a high-definition plasma distributor and, after the show, he came to see our fabrication operation and quoted on one of these systems, but it was a little too expensive for us at that time.

“Soon after, however, the Lincoln Torchmate air plasma became available in South Africa and Pierre, who was then with Cosmo Automation Solutions, came to us with an alternative approach. Instead of borrowing capital for a high

definition plasma cutting system, he suggested we look at a smaller investment for an Lincoln Torchmate 4800 air plasma where we would be able to cut 80-90 percent of what we were outsourcing and see how it went before installing a more expensive machine,” Krebs recalls.

“High definition is expensive. Smaller guys like us can't simply go to a shop and buy one. The machine we were looking at, at that time, would have cost us around R1.8-million,” he adds.

“The Lincoln Torchmate 4800 is an air plasma solution, and I was a little concerned about the cut quality. But when I saw the system demonstrated and compared the cut quality to high-definition cuts from outsourcing, I could barely tell the difference,” he tells *African Fusion*.

So in 2018 for a little less than R600 000, Martin Krebs bought a Lincoln Torchmate 4800 air plasma CNC cutting system with a Lincoln FlexCut 125 plasma cutting power source from Cosmo Automation Solutions.

The Torchmate experience

With a bed size of 1.25x2.50 m, Tsipe



Above: With a bed size of 1.25x2.50 m, Tsipe Engineering's Torchmate 4800 cuts standard sheet of 1.2x2.4 m and the FlexCut 125 can cope with thicknesses of up to 25 mm.

Left: An integrated touch screen HMI, industrial grade user console, and the CNC motion control system make for 'plug and play' installation.

Engineering's Torchmate 4800 cuts standard sheets of 1.2x2.4 m and the FlexCut 125 can cope with thicknesses of up to 25 mm. “But we seldom need to cut plate this thick. For our gun safes, for example, we are cutting 3.0 and 6.0 mm plate and for our staircases we use mostly 6.0 and 8.0 mm thicknesses. This machine is a shoe-fit for most of our work, producing the cut quality and flexibility we need to offer better products and a better service,” he says.

Advertised to be ‘ready to run in 30 minutes; the installation of Tsipe Engineering's Torchmate 4800 CNC plasma cutting systems was painless and rapid. “All of the necessary components to operate the system: an integrated touch screen HMI, industrial grade user console, and the CNC motion control system make for a ‘plug and play’ installation,” Krebs suggests.

The cutting table is freestanding and while it does need to be placed on a solid flat floor, no mounting is required, which makes it easy to install and relocate.

“The FlexCut 125 power source that comes with this system can operate at 125 A at a 100% duty cycle. This is important as we like to cut whole sheets, so the machine needs to be able to cut continuously for hours on end mostly 4-5 hours a day without having to cool down between cuts,” he adds. The Flexcut 125 also has a marking feature, which is very handy.

Completing the total fabrication offering

Having installed a cutting solution at the start of his fabrication cycle, Krebs is now in full control of fabrication services to his clients, from design to product delivery or installation. “The Torchmate controller is networked to our design office, so for scheduling production, I will take the components I need to cut and nest them onto a 1.2x2.4 m sheet. I can then download the cutting plan to the Torchmate and I am immediately ready to cut,” he says.

From a cutting quality/speed perspective, Krebs says that, once the plate thickness has been selected, the machine automatically returns a set of preset cutting parameters, most importantly, current and cutting speed. “The presets can be used directly, but they can also be adjusted depending on the preferred cut quality. A slower speed can give a better quality, for example, but where the edge quality is less important, a faster speed can be used,” he explains.

The off cut material? “I tend to choose a 10 mm gap between cuts, mostly to keep the skeleton intact after cutting. This allows us to remove a fully cut sheet far more easily and, if we haven't used the whole plate, we can reload the plate to cut an additional small job at a later stage.

“I also have a crane, which means I can unload and reload a sheet in about



Manufacturers are now able to take advantage of Tsipe's whole fabrication service.

four minutes. I currently keep my Torchmate busy for four or more hours every day, cutting between 40 and 60 t of steel per month,” says Tsipe's Martin Krebs.

As a result, he has reduced his outsourcing costs by 90%, with the resulting savings being used to pay off the investment.

“In addition, I have people coming to me for cutting services. We now do all of the cutting for a local company that makes canopies for utility vehicles. They have also expressed an interest in taking advantage of our whole fabrication service, which they would never have been interested in before we had the Torchmate,” he believes.

The payback period? “I recouped the investment in 12 months from the difference between outsourcing costs and my actual current costs,” he responds. Generally speaking, if a fabricator's outsourcing bill for cutting exceeds about R30 000 per month (excluding plate), then these machines will definitely be cost effective.

“We still outsource some work on thicker plate than the 4800 can handle, so I am now looking to see if I can bring this work in-house too. Lincoln recently released a Torchmate 5100 with a Flexcut 200, which would enable me to cut 3.0x1.5 m plate at thicknesses of up to 32 mm.

“It may prove worth my while to buy a second system,” he concludes. ■