Efficient Engineering: world-class quality, capability and experience

African Fusion visits the fabrication facilities of Efficient Engineering in Tunney, Germiston and talks to Gerhard van Zyl, business unit manager for Pressure Vessels; Gary Colegate, the company's COO; and its Quality Manager and Welding Engineer, Dries Vandezande.

Efficient Engineering was first established by Giuseppe Cimato back in 1968 as a small general engineering and fabrication shop manufacturing seat frames and operator cabins for forklifts, customised trucks, and mobile materials handling equipment. "Tony Cimato, our current chairman, joined his father in the business in the early 1980s, then slowly took over as the business expanded," says Gary Colegate, chief operating officer for Efficient Engineering. "In 2007, 2008 the business started to get really big, so they built the first of five new facilities based in Elandsfontein in 2009.

One of the company's key longstanding successes has been with a leading local OEM, initially on the refurbishment of large dump truck (DT) bodies for the opencast mining industry. "We have been working with this specific OEM for over 30 years, and the business is still strong and growing today, particularly since we started moving into the fabrication of new DT type bodies for Komatsu and other overseas OEMs," says Colegate.

"Interest in our capability in the manufacture of yellow metal components for leading global OEMs continues to increase, partly driven by the DTiC's Equity Equivalent Investment Programme (EEIP), which was created for multinationals whose global policies prevent them from complying with the ownership element of B-BBEE," he explains.

As part of its expansion, Efficient Engineering also became a go-to fabricator for locally manufactured materials handling equipment such as ship loaders, stacker reclaimers and drum reclaimers for Southern Africa's mines, ports and power stations. "With the exit of certain OEMs from the South African materials handling business, and based on our experience of the past, which has been quite substantial, we are now seeing potential growth opportunities for this side of the business," Colegate adds.

Gerhard van Zyl, the pressure vessels business unit manager continues: "RMB Corvest bought into Efficient Engineering as the majority shareholder in 2010, and immediately saw the need to start diversifying from being solely dependent on the mining industry. The obvious choice was in pressurised equipment for the oil and gas industry; so, in 2012, I was invited to start this division," he says.

Today, Efficient is a leading local manufacturer of critical process equipment for the oil and gas industry, providing pressure vessels, process columns, shell and tube heat exchangers, air cooled heat exchangers and piping that is fully compliant with the industry's national and international codes, standards and specifications.

Operating out of three large heavy engineering fabrication facilities in the Tunney Industrial estate in Elandsfontein, Germiston, South Africa, the company now offers engineering, steel fabrication, machining and manufacturing to world-class standards, for South African clients and, increasingly, to mining clients across Africa. "Our African market is growing," says Colegate. "We are seeing export opportunities that we haven't participated in before. We are currently investigating the options to set up local facilities to service several African countries and we expect exports to start contributing substantially to our turnover in the near future," he tells _African Fusion_.

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Investment in welding productivity and quality

Efficient Engineering is currently involved in an extensive investment drive to better meet growing demand for high quality equipment to OEM-specified international standards. "We have embarked on a R55-million investment programme in new welding machines, large horizontal boring machines and other equipment to deliver the better productivity and quality our customers need," says Dries Vandezande, the company's Quality manager and one of the company's three in-house IIW-Certified welding engineers.

At the start of this investment is a new fleet of 33 water-cooled UNIARC SYNERGIC500 MIG/MAG welding machines that are locally assembled and supported in South Africa by Renttech. "In addition, to advance our tube-to-tube sheet welding capability, we have purchased two state-of-the-art Polysoude orbital tube-to-tube sheet systems. As well as delivering far better repeatability, we are looking for better mechanical properties on our boiler and heat-exchanger welds, because these are increasingly manufactured from critical steel types that require precise welding heat input. These orbital machines, which can each manage two independent welding heads at the same time, will put us on top of a niche market for fabricating high-end pressure equipment," he says.

Efficient Engineering is a leading local manufacturer of critical process equipment for the chemical and petrochemical industry, providing pressure vessels, heat exchangers and piping.

Gerhard van Zyl continues: "With the current investment in the tube-to-tubesheet orbital welding machine, we now have the opportunity to further expand on the automation of pipe welding seams by simply adding welding heads to our current equipment. This will help us to produce better pipe welding seams. A wide range of pipe and nozzle sizes can be accommodated and, compared to having to do a manual TIG root and several stick filler passes to complete a pipe or flange weld manually, followed by extensive fettling, the Polysoude machine will be able to produce sound welds more quickly and more consistently, without the need for post-weld repairs," he tells _African Fusion_.

"We are also investigating the use of robots to improve productivity for the dumper truck bodies," continues Vandezande. "Initially to manufacture replacement ribs, which are high volume components with a relatively simple section. From there, we will investigate if a robot is suitable for any of the other manually welded components we need," he says.

"The underpinning idea for all of these investments is to use modern technology to raise quality levels and to put ourselves in front of other competitors in terms of productivity and capability," he suggests, adding that, like every fabricator in the highly competitive modern world, there is a need to offer more while reducing costs and improving quality.

As an ISO 3834 Part 2 certified welding fabricator for over 10 years, Efficient Engineering holds fast to the belief that weld quality needs to be systematically built into every part of a product through a properly implemented weld quality management system. "If you create a quality focused culture right from the beginning of a project and follow it through all the way to the end, you are sure to pass any certification audit. The ISO 3834 certificate it not just a badge, though, it tells our clients about the systematic way we go about controlling how every weld is done on the shop floor to ensure procedures have been followed and the quality requirements have been met. In addition, it assures that full proof and traceability of the process is recorded and available through the paperwork," he advises.

Van Zyl continues: "Working in the petrochemical industry really pushes us to make certain that all the paperwork for the welding quality system is in one place, so working in this way is a norm in our organisation. We take the same approach with the mining equipment, which doesn't always have the same high-level quality requirements.

"Also, 95% of major chemical companies require their fabricators to be ISO 3834 certified. If you are not certified, you won't get onto the approved suppliers list," he points out. "We often need to comply with ASME Appendix 10 as well, and while this is often overlooked, the South African Pressure Equipment regulations (SANS 347), which is part of the OHS Act, specifies that all equipment under pressure must be manufactured according to a weld quality system equivalent to ISO 3834," he adds.

For all welding activities, Efficient Engineering enforces its quality system. "We always have a procedure specification (WPS) that the welders must follow and we call for hold points when inspection must be done," says Dries Vandezande.

"So for all welding activities in Efficient Engineering, we enforce our quality system: we always have a procedure specification (WPS) that the welders must follow and we call for hold points when inspection must be done, etc, etc," adds Vandezande.

"We are very fortunate to have three fully qualified welding engineers working for us full-time, which many other fabricators have to contract in. Implementing our quality standard and delivering quality end products, differentiates Efficient Engineering from the other companies," continues Van Zyl. "We have in-house people who love welding and who are continuously ensuring that good decisions are being made based in the best interests of Efficient Engineering and its clients.

"That is why we are called Efficient," says Gary Colegate. "As well as being certified in all aspects of safety and quality, we have a flexible, dynamic, well qualified and very experienced management team that runs a very professional operation. We have managed to grow this business in very difficult times and I am pleased to say that we are now well positioned for a new era of growth.

"We are a highly respected fabricator and know we can stand proudly among the best in the world," Gary Colegate concludes.

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