

Robb and Carter Manufacturing specialises in production and jobbing machining

Taking something over from your father-in-law is no easy task no matter what situation you can think of. When you have decided to purchase the business from him, that he started over a half a century prior, you better make sure that you are motivated and confident enough to keep the business on a sound footing and not run it into the ground. You can say that you have made a success of your purchase when, nearly 17 years after the acquisition of your father-in-law's prized possession, you have an average of 13% growth per year in the annual revenue turnover and doubled the size of the factory that you operate from.

"You could say it was intimidating at first but I had worked at the company for 16 years prior to taking 100% ownership of it so the transformation was a huge jump in responsibility, but the significant support I was given by my predecessor provided for a smooth change of ownership."

"It was a bold move when Arthur Carter and his partner established the company in 1948, not long after the Second World War and just up the road from where we are situated now in Factoria, Krugersdorp. Robb and Carter Manufacturing Co. (Pty) Ltd were one of the crop of the post-war ventures that helped to initiate and, by constant application of the latest techniques in their field, accelerate the vast industrial development of South Africa at the time," said Chris Ziraneke, Managing Director of Robb and Carter Manufacturing Co. (Pty) Ltd.

"As with many other successful ventures that were started with limited financial resources, the company's entry into manufacturing was modest. The staff comprised of the two partners — Arthur Carter and Eric Robb — and their equipment consisted of two small bench lathes."

"Their first contract was for making a small quantity of shop fittings. Once the contract was completed, they decided to specialise in repetition machining and precision work. This is



The original building that Robb and Carter started off in

still the ethos of the company today although on a grander scale and with the utilisation of modern CNC equipment."

"As a start, the partners concentrated on nuts and bolts to customer specification, then developed gradually into fully-fledged production engineers. Their early equipment was replaced and augmented progressively so that the company was soon equipped with modern hydraulically operated turret lathes and general-purpose semi-automatic machines. The technical staff rose in conjunction with the growth of the company and was soon up to 24, which is not much different to the staff complement that we employ today."

"The partners were also big on quality and developed a fully equipped inspection department to ensure that every component that the company machined conformed exactly to specification."

"This attention to detail won the company a high reputation for precision machining to close tolerances. As a result, the company was able to gain official recognition as contractors to government departments, the gold mining industry and as sub-contractors to big companies such as Vecor, as well as to manufacturers of drill rod equipment and steel scaffolding units."

Thread whirling

"Robb and Carter was one of the first engineering companies in South Africa to make use of thread whirling when they introduced this efficient method of making special threads on a mass production basis in the mid 20th century. Due to this, my late father-in-law, Arthur Carter, became an expert in the field and even designed and built his own machine for the process. We still use this process in the company today and his machine still operates."

"Thread whirling is a form of the thread milling process with the exception that the cutters are mounted on the inside of a



**The management team at Robb and Carter Manufacturing
Chris Ziraneke (Director), Elaine Faber, Dolf Marais,
Selwyn Kern and Reinart Bergh**

cutting ring or cutter holder rather than the outside of a milling tool.”

“Thread whirling uses a holder equipped with a single or multiple inserts that are mounted into an attachment capable of helical angle adjustments and high speed concentric rotation. The workpiece, which is advanced at a slow rpm, engages the cutting head, which in turn is advanced longitudinally. The combined rotation of workpiece and cutter, and the angle of the tool head, generate the thread form required. Depending on the part configuration, the cutter angle can be adjusted to compensate for large helix angles.”

“Since thread whirling progressively generates the thread, the thread is created in a single pass and in a shorter time than with single-point threading. High feed rates, likewise, shorten cycle times. Thanks to the optimally high cutting speed, the process delivers very high surface quality and accurate geometry. Cutting is clean with faster chip removal, and proper cutting edge geometry delivers higher concentricity.”

“Because cutter side clearance is achieved by rotating the whirling spindle, as opposed to relieving material under the cutting edge, inserts have a significantly longer tool life than single-point tools.”

“Perhaps the most important thing to remember for getting started with thread whirling is the fact that, because of its highly specialised nature, the process requires a different mindset than conventional high speed applications. The tool-holders are designed according to different machine types and manufacturers, and it’s necessary to locate a supplier whose equipment line best fits the machine(s) on the shop floor.”

“At Robb and Carter we can generate Acme, Trapezoidal and other square threads typically used on lead and feed screws on material from about 25 to 105mm in diameter, for lengths of up to 2.2 metres.”

“Thread whirling is also used to produce our recoverable anchor screws — a product that provides an efficient and economical method of securing formwork to concrete. They are particularly useful for cantilever forms as used in dam construction, high-rise buildings, tunnels and other similar work.”



Robb and Carter was one of the first engineering companies in South Africa to make use of thread whirling and still offer the service today



A machine designed and built by Arthur Carter, one of the founders of the company

Training and the latest generation CNC equipment

“One of my goals when taking over the company in September 2000 was to continue to create an environment most like the one I would want to work in as an employee. It had to be lean but not mean. I wanted pride in ownership to be a part of every employee’s experience — that means giving people the responsibility to work to the highest quality standards yet be fully cross-trained to handle jobs through every step of the manufacturing process.”

“There are two ways of doing that. One is training and the other is having the latest generation equipment that my staff can work on. Over the last 30 years our production methods have advanced significantly. In the old days it would be one man operating one conventional machine. As technology advanced, we embraced CNC technology and now have 16 CNC turning machines and seven CNC machining centers on the shopfloor.”

“In 1984 the company only had one qualified fitter and turner and one qualified tool, jig and die maker. Today we have one degree engineer, one engineering undergraduate and seven qualified tradesman with four qualifying while they have been working for the company. In-house training is also always taking place so that the staff become more technically qualified.”

“As a result, we now have staff that can operate two CNC machines simultaneously and sometimes four.”



A cell of Victor Fortune machines including the latest addition, a Victor VC205 CNC machining center



The Victor VC205 CNC machining center has a two metre bed and comes with a removable partition that allows Robb and Carter to load/unload a component on one side of the table while another component is being machined on the other side of the table



Robb and Carter has 16 CNC turning machines and seven CNC machining centers on the shopfloor



MTP have supplied a Kiheung bed type CNC universal milling machine



Robb and Carter have four bandsaws that are cutting bar to size

With one of our recent purchases – the Victor VC205 CNC machining center – we are able to leave the machine unattended for up to six hours when, for example, die sinking some forging die blocks.”

“Employees are expected to set up and programme various CNC machines and keep them running simultaneously. One of the most basic elements of the mindset at Robb and Carter is an emphasis on many machines and few employees. Each skilled machining employee routinely has one or more machines running and producing while he is setting up yet another job on another machine. This is how the flexible automation capabilities of the equipment are leveraged, and this is how the value of automation is realised. It also makes the staff more productive and the machines cost effective, and it is all because of our emphasis on training.”

“Most of our machines in the machining departments are Victor Fortune machines and we look to purchase one or two new ones a year. A recent addition is the Victor A26 turning center that is equipped with live tooling.”

“Our latest addition, the Victor VC205 CNC machining center, has a two metre bed and comes with a removable partition that allows us to load/unload a component on one side of the table while another component is being machined on the other side of the table.”

“We machine most ferrous and non-ferrous materials including plastics and one of our Victor CNC lathes is equipped with a bar feeder so we can do bar work. We also have four bandsaws that

are cutting bar to size.”

“Current staffing at Robb and Carter numbers 24 employees with some employees having nearly 40 years experience to count on. The company is reluctant to increase its employee base unless it sees new or expanding business that promises a long-term increase in demand as opposed to a short-term surge. In fact the total number of staff has reduced in the past decade or two even though the company has more than doubled its capacity.”

Rods Engineering Works

The company did see a surge in employee numbers totalling 35 when it acquired another engineering company – Rods Engineering Works – a company that was established in 1973 by Alberto Rodrigues in the Robertsham area of Johannesburg.

“Through the years, Alberto developed the machining capabilities of his company for production and jobbing work, gaining wide recognition in the mining, pump, valve and associated industries.”

“When we purchased his company we wanted to expand our capabilities to being recognised as a production and jobbing machining company with safety critical components being an important part of the mix of components we manufacture.”

“The original products that the company

manufactured when it was established – bolts and fastener components – are still being churned out here.”



Robb and Carter manufacture bolts and other industrial fasteners



Other components that Robb and Carter regularly machine include shafts, studs, die blocks and many other general engineering components

Rail joints

“There are basically two types of rail joints, standard (non-insulated) and insulated (block joints), both of which are manufactured by the company. Both use fishplates of various forms and sizes. Rail joints are an important component of a railway track systems used to connect two legs of rail together.”

“Our insulated rail joints (block joints) are used in the railway track network to mechanically connect two legs of rail together, but electrically separate them. This is required in col-

our light railway signalling, and electrical isolation, for example, in petrochemical sidings. The DHJ frozen (glued) fishplate insulated rail joint system assembly generally consists of two insulated fishplates, an insulated end post ('T' piece) and all necessary nuts bolts and washers."

"These joints are generally assembled in workshop conditions and are supplied in typically six metre lengths of rail. The assembly uses a high grade insulating epoxy glue that both bonds or freezes the assembly into one solid structure, and creates the insulating layer."

"The PU insulated rail block joint system comprises fishplates manufactured of a dense polyurethane material bonded to steel inserts that provide superior insulation between the two legs of the rail. This produces a firm structure that can provide high electric isolation for signalling circuits."

"With the special design, the structure can provide years of heavy duty service and require little or no maintenance."

"These products have gone through over 40 years of a continual development partnership between this company and the railway industry."

"Other components that we regularly machine include shafts, studs, bolts, other industrial fasteners, die blocks



The company churns out hundreds of bolts and other fastener components



Robb and Carter is versatile in the complexity of the components that the company manufactures



More components manufactured by Robb and Carter



Robb and Carter manufacture two types of rail joints, standard (non-insulated) and insulated (block joints)



A small variety of components that Robb and Carter manufacture

and many other general engineering components."

Toolmaking

"Since 2010 we have been manufacturing complete tooling for the closed die forging and the injection moulding industry. The company now has the technology, including that of being fully licenced with Solidworks and Edgcam software, and the capacity to machine blocks of up to 1 200 kilograms."

"We have also recently purchased two 150 ton eccentric presses, one 120 ton hydraulic press and a 120kW LH Power

induction furnace. We have manufactured our own dies, as we do with all our jigs and fixtures, and now have a simple but effective forge in operation."

"At the end of the day we are a production and jobbing machining company specialising in industrial fasteners and machined components generally from 20mm in diameter upwards for the railway, mining and construction sectors. The factory is 2 000m² plus offices and is situated on our own property in Factoria, Krugersdorp."

For further information contact Robb & Carter Manufacturing on TEL: 011 955 1010 or visit www.robbcarter.co.za



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The company still has some conventional machinery on the shopfloor