

METALWORKING NEWS

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November 2017

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Get a balanced viewpoint on visiting EMO



The overwhelming feedback from visitors from South Africa that visited the EMO 2017 exhibition in Hannover, Germany in September 2017 was that the exhibition was an eye opener for young and old alike.

“As a first time visitor to the EMO machine exhibition we could not believe the sheer size of the exhibition. Words cannot do the exhibition any justice and the only regret that we have is not having gone there years before. If we may offer one piece of advice to anyone that is involved in the metalworking industry and in any position they might hold we would recommend that at least once in their lifetime they make the effort and visit the EMO exhibition,” said Walter Bellora of BCF Precision Grinding.

“The exhibition really opened my eyes to what is available in the world and the massive size of the manufacturing sector. I realised how small our local market actually is, and saw a lot of brands that I have never heard of. It became evident that our industry and economy are very far behind compared to the big world out there, but we must see that as an opportunity for growth and use factors like our exchange rate to our advantage,” said Eugene Hugo, JHPE Precision Engineering.

“The exhibition as usual was of an exceptional standard. What was evident was the increase in technology with regards to the digitalisation of information for manufacturing processes, automation, all with the aim of improving production efficiency,” said Aurelio Grech-Cumbo of RGC Engineering.

These statements typify the reaction of most South Africans that visit EMO for the first time and those that are repeat visitors. I must say that it was encouraging to see so many first-timers and how they reacted to soaking up so much of the knowledge that is available, which is not easy to find normally.

But the best comment came from first-timer Filipe Dos Santos of Perfection Tool & Die. His comment is very perceptive and all in the metalworking industry should note its context. This is what he had to say: “I believe the show was well worth it and I will be implementing a few technologies that were seen at EMO in the near future, which will save our company 100 fold compared to what the trip cost us.”

And believe me with our current exchange rate and the fact that accommodation is at a premium over the exhibition period, these rates are not cheap. One visitor said he was paying euro 197 per night to stay at a private B&B that only operates during the exhibition time.

What was also reassuring was the number of South African visitors who were from the same family and the father and son visitors. It is these SME engineering companies that are the backbone of a manufacturing based economy and South Africa needs more of them.

The networking that took place between the South Africans is always something I encourage. As one veteran visitor who attends EMO regularly and has been doing so since the 1990s said to me: “You never know when and how you can help each other down the line. The business opportunity might only take place in seven or so years time but at least you have had the opportunity to build some trust by getting to know the individual in a neutral environment. And who does he call first?”

A comprehensive report on the exhibition and the trends happening in our industry appears in the International News section of this issue.

Comment, observations and opinions are not made by just one individual but by many, so you can get a balanced viewpoint.

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Busting the myths about artificial intelligence

Manufacturers face a difficult task juggling the current “innovation agenda.” Today, the Industrial Internet of Things (IIoT), robotic automation and artificial intelligence (AI) are all poised to be the next big thing. But those on front line of manufacturing are cautious to embrace innovation — and rightly so. Too often expectations are unfulfilled, capital investments are made in vain, and experimentation doesn’t translate positively into profits.

Instead, many enterprises take a wait-and-see approach. They wait for leading companies, with bigger budgets, to figure out how to make these new technologies viable, in the process educating the rest of the market. But AI is different. Industrial AI is focused on using data from equipment and sensors to make intelligent predictions and automate operational decision-making. Manufacturers cannot afford to wait around to implement industrial AI — the rewards are far too great. Despite the myths about it, Industrial AI is a rare case of affordable innovation without inherent flaws. Let’s go through the myths one by one.

Myth #1: AI is expensive

While all innovations have the potential to improve manufacturing, they often require large investments. But AI can achieve tangible results without significant investment. The secret lies in knowing how to apply it and taking advantage of the R&D efforts already made by Internet-based companies. Indeed, algorithms used by Amazon and Netflix can now be transferred to offline shopfloor implementations. For manufacturers, the heavy lifting developing and testing of the core technology has already been accomplished and paid for.

However, manufacturers should understand where on the shopfloor AI will be best applied. Do not be misled by the futuristic idea of “connected factories.” AI can come in a much less extravagant, very practical format such as optimising existing processes with existing data. Given manufacturing’s traditional processes — established workflows, 24/7 operations, and long equipment lifecycles — AI has plenty to work with.

This will soon be the AI we know. Invisibly integrated, it will improve areas such as raw material spending, energy efficiency, and throughput with more precise decision-making at every step. What’s more, no capital expense or new hardware will be required.



Myth #2: AI only delivers real results in the long-term

Upfront cost isn’t the only fear manufacturers have when investing in innovation. Concern about the time required for a return on investment (ROI) can also overshadow technological ambitions. In manufacturing, deployment of innovative technology can take years, with ROI sometimes measured in decades. Other priorities intervene and managers may become less incentivised when the end results are not guaranteed.

The situation is different with industrial AI. Building AI-based models takes months, not years. Testing to measure the results of AI on continuous processes requires only days or weeks. Once the model is applied, it immediately generates value by producing results that guide further strategic changes.

Myth #3: AI disrupts existing processes

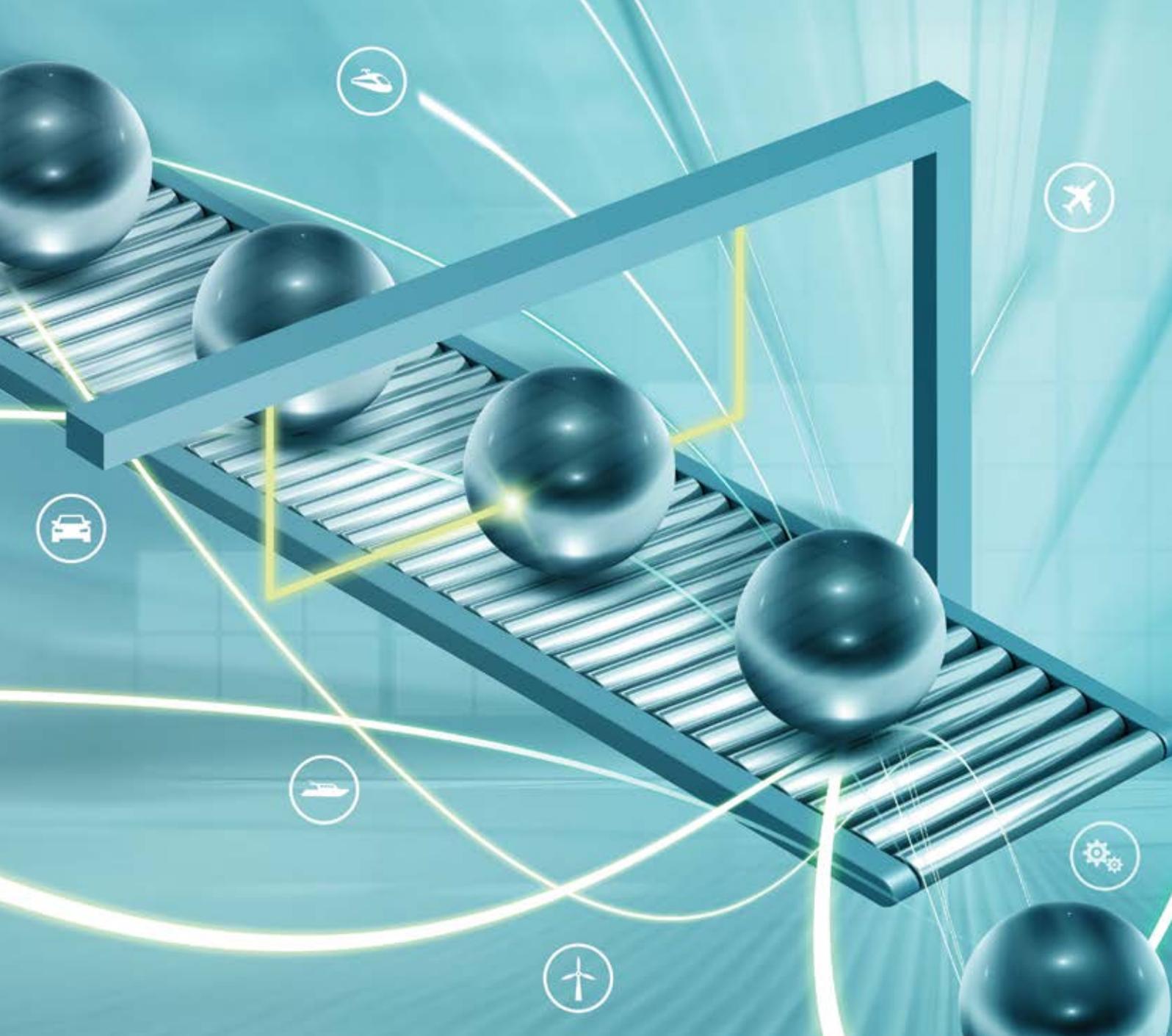
People are naturally apprehensive about change, especially when it involves altering a process that already works. One change often leads to another, and, as experienced managers know, even when technology works the integration and adoption process can be challenging. However, when AI is used to optimise processes, none of this applies.

Where AI is used for optimisation, there is no need to revamp the production line or train staff to use new process controls. Nor are complex IT integration projects — often the cause of grievances among CIOs and end users — necessary. Instead, the same business processes are carried out by the same means, but in a way that is far more efficient. For example, AI can suggest the best modes of equipment operation or the exact amount of raw materials required, all in the same interface your operators already use. The only thing affected by AI is the manufacturer’s bottom line.

AI has long been on the manufacturing radar. But today, with both sufficient computational power and critical data available, AI can be effectively pursued. There are few reasons to delay an AI project. The technology is already here and fears about innovation do not apply. In the case of AI, there really is no time like the present. ■

By Jane Zavalishina, CEO, Yandex Data Factory.

This article was first published in the Manufacturing Engineering magazine.



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cover story

Pegasus Steel adds fifth Trumpf laser to increase production and quality



Pegasus Steel's latest acquisition is a Trumpf TruLaser 5040 8kW fiber laser cutter with a 4 x 2 metre cutting bed

Pretty much every service centre processing sheet and plate looks for process flexibility from the machine tools it selects. These companies need to be process agile because of the nature of the work that they do for their clients.

Service centres such as Pegasus Steel tend to be creative in ways that help streamline the metalworking process to maximise productive machining time and minimise costly non-productive time.

"Pegasus Steel believes that the only way you are going to stay ahead and satisfy the demands of clients is not to dream about the equipment you would like to have on your floor but rather to take action and invest," said Alex Russell, joint owner of Pegasus Steel.

"Our latest acquisition is a Trumpf TruLaser 5040 8kW fiber laser cutter with a 4 x 2 metre cutting bed, which takes our Trumpf laser cutting machine tally to five. The new TruLaser 5040 fiber allows us to cut carbon steel sheets up to 25mm, stainless steel sheets up to 40mm, aluminium sheets up to 25mm and copper and brass up to 10mm."

"The acquisition of this machine underwrites our philosophy of always having an investment programme in place and not having a shotgun attitude of we will invest in new equipment when the need arises or when we are forced to."

"The way the development of modern equipment is advancing these days, with new features and capabilities being added all time, it does not take long for your equipment to be labelled out of date, slow and not accurate. It is an unfortunate situation for not only us in the metalworking industry but in most spheres of industry. We are in an era where technology is advancing so fast that keeping up with it is daunting."

"When I look back at the first laser that we purchased in 2006 and the specifications and capabilities of it as compared to our latest machine from Trumpf the differences are vastly different."

"It is not that the materials that we cut have changed much therefore demanding changes in the way the machines have to cut the material, it is rather the requirements of accuracy and speed. This is nothing new and these requirements will always be a demand from us as service centres and from our clients."

Game changer

"It is an old cliché but we really believe that this new Trumpf fiber laser is going to take us to another level. It is one of the first of its kind to be installed in South Africa and will

put us at the forefront of the companies that use Trumpf equipment.”

“We are always looking at ways of improving the company’s metal cutting and plate forming capabilities. Besides adding new and updated lasers over the years we have always added and improved our efficiencies for high definition plasma cutting, CNC bending, CNC oxyfuel cutting, CNC punching, guillotine cutting, rolling and fabrication. We are so serious about our service that we even went the route of investing in a Haas gantry router just to primarily carry out our chamfering and beveling work.”

“Another advantage of that machine is that it gave us the opportunity to offer clients surface facing of plate, as well as being able to add grooves, holes and slots. On the drilling side we are also able to add thread.”

Trumpf TruLaser 5040 fiber laser – fusion cut up to 100% faster than standard cutting

“Short lead-times have become a necessity for business survival these days. It’s necessary to manufacture efficiently to have a chance of getting the job in the first place. We also work to the principle of trying to do everything, where possible, in house. Once in house, making good parts in ways that make the shop money becomes job one. Besides, if we are given more opportunities to add additional beneficiation to a component, the client will save time and money.”

“The performance capacities of the 2D laser machines and the solid-state lasers made by Trumpf continue to advance.



The machine has been coupled with automation — a LiftMaster Compact. At the heart of the LiftMaster Compact is the synchronous loader, which loads and unloads in parallel

With the Trumpf 5040 fiber laser, the machine we have purchased, it is now possible to fusion cut up to 100% faster than standard cutting using TruDisk 8001 with as much as 70% gas reduction. This is made possible by using the new feature High Speed Eco Cut.”

“With a patented touch down nozzle design not only can we reach ridiculous cutting speeds with as little as 10 bar cutting gas pressure but we can use compressed air as

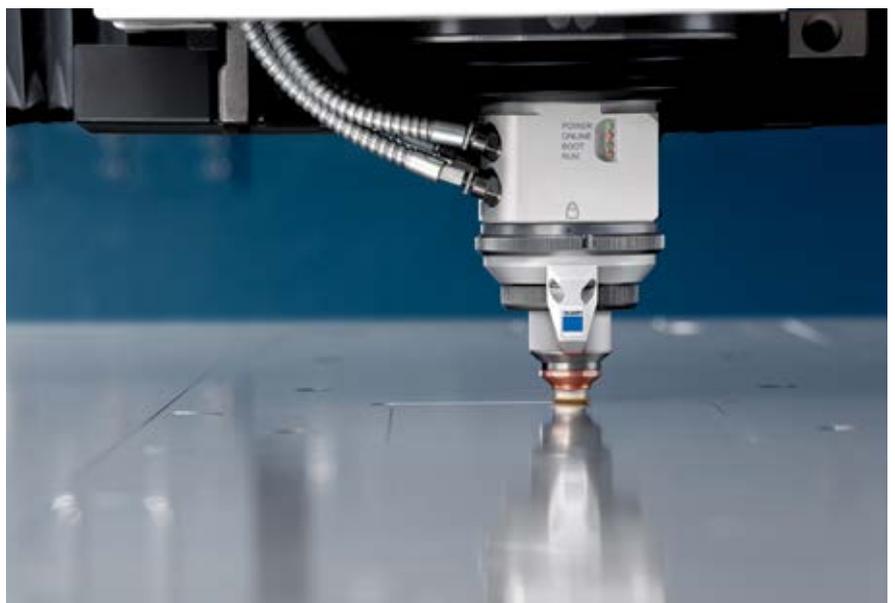
a cutting gas on mild steel up to 12mm.”

“With the TruDisk 8kW laser source we are able to use maximum laser power to cut thick mild steel up to 25mm with exceptional cut quality using the BrightLine Fibre feature. This is made possible by changing the spot size of the laser beam at the cutting point directly at the laser source, allowing us to have a larger kerf width so thick parts fall out from the skeleton without the need for tools (hammers) seen in use in the field. This is unheard of in the field of laser cutting, even on higher laser powered machines.”

“Solid-state lasers can as much as triple feed rates. Yet taking advantage of this benefit and achieving rapid part processing requires a highly dynamic system. Thanks to its direct drives, this TruLaser 5040 makes optimum use of the fiber-guided TruDisk laser’s high feed rates which translates to the shortest part processing times. The efficiency of the fiber-guided TruDisk 8001 is twice that of a CO2 beam source, which means less power consumption. This slashes the machine’s total connected load paring down costs even further.”



Universal cutting head



Nitrogen cutting at record speed with a solid-state laser: The sheet throughput for medium to thick sheets is increased by up to 100%. At the same time, the gas consumption goes down — by as much as 70% with Highspeed Eco



CoolLine: The selective cooling of the workpiece during the cutting process allows new geometries and significantly increases process reliability in the processing of thick mild steel

“Once again Trumpf have introduced new innovations that will make a decisive advance in laser cutting. Among these features is the intelligent beam monitoring system – Smart Beam Control. It lends even greater reliability to the solid-state laser machines in the TruLaser Series 5000. Smart Beam Control automatically regulates the laser’s focal position during the cutting process itself. This function makes for constant superior reliability and makes it possible, in addition, to carry out a diagnosis of the cutting system. This can also be done from a remote location, using Teleservice.”

The new Condition Guide function for the TruLaser Series 5000 enhances transparency. A single glance is enough to determine the machine’s status. A traffic light system provides information on the condition of key elements that affect the machine’s cutting capacity. The Condition Guide can, if desired, provide information on corrective actions to be taken by

the operator. Line charts show the history of the particular condition and simplify forecasting the need for intervention. Consequently, maintenance work can be planned both efficiently and in harmony with actual needs.

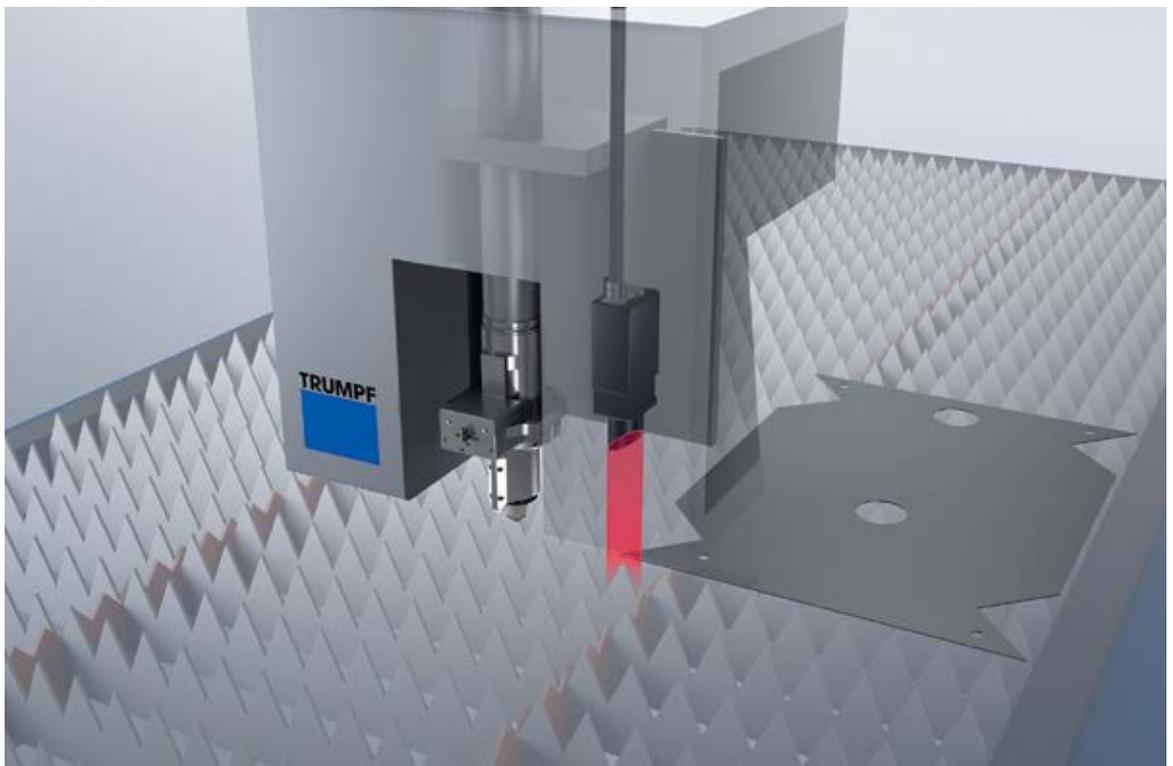
Stainless steel 40mm

“BrightLine Fibre also allows us to cut thick stainless steel with extremely high quality edges up to 40mm. With all the safety and productivity features on this machine type, it is safe to say that the TL 5040 fiber 8kW range of machines when coupled with automation – our machine has a LiftMaster Compact – are the most productive / process safe machines on the market.”

“Our success has been achieved by our friendly approach, listening to our customers’ requirements and providing effective solutions within budgetary constraints. Our unrivalled depth of experience and extensive range of equipment enables us to provide innovative solutions to save our customers time, labour, material and money,” Alex Russell was proud to finish off with.

Pegasus Steel is a one-stop three-shift, 24-hour seven-day-a-week steel working service centre specialising in CNC laser cutting, high definition plasma cutting, CNC bending, CNC oxyfuel cutting, CNC punching, guillotine cutting, rolling, forming and fabrication. The company is ISO 9001 certified and has a level 3 BBEE.

For more information contact Retecon Machine Tools on TEL: 011 976 8600 or visit www.retecon.co.za or Pegasus Steel on TEL: 087 310 2863 or visit www.pegasussteel.co.za ■



DetectLine is an optical measuring system that uses several test points to determine the position of individual blanks and automatically determines the optimum focal position. To this end, contours are cut in a small area of the sheet using different focal positions. The camera system checks the width of the gaps and transmits the correction value for the focal position to the control unit. This means the loaded blank can be further processed with the laser, offering a high degree of precision



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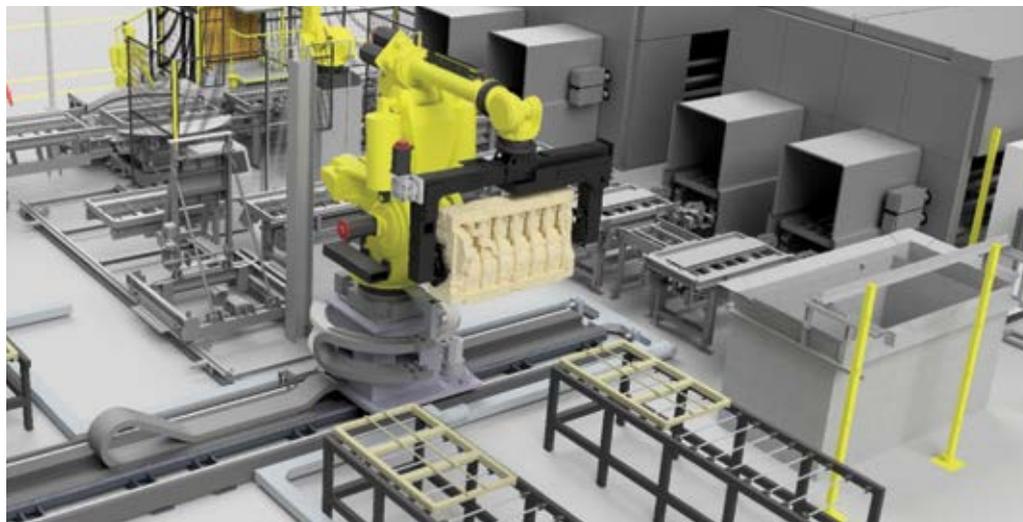
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Atlantis Foundries embraces the Fourth Industrial Revolution

Atlantis foundries have embarked on a process that will pave the way to becoming a Smart Foundry by embracing the Fourth Industrial Revolution. This project aims to combine various technologies available to gather and analyse process data, with the aim of improving product quality and cost efficiency.

Atlantis Foundries manufactures commercial vehicle engine blocks for all of the blue chip international truck manufacturers. The list of manufacturers of trucks that the company supplies is an indication of the quality standards demanded of and achieved by Atlantis Foundries. Atlantis Foundries supplies commercial vehicle cylinder blocks to the engine plants of Detroit Diesel, Mercedes-Benz, MAN, Perkins and Cummins. The engines in turn are supplied to manufacturers such as Mercedes-Benz, Caterpillar, Western Star, Mitsubishi Fuso and Freightliner.

To further improve the quality and cost position of Atlantis Foundries, they have embarked on an ambitious plan to build a Smart Foundry. The basic building blocks for such a



After the drying process, core vents are drilled using a Fanuc M-20iA robot. The robot will, in future, carry instruments to inspect the various cores as well as the core assembly

available for each casting,” explained Pieter du Plessis, CEO of Atlantis Foundries.

“This process data will be analysed using Artificial Intelligence to predict various aspects of the castings such as material properties and sub-surface defects. Atlantis Foundries have partnered with DataProphet, a Cape Town based Company. The pilot project using Artificial Intelligence aims to predict sub-surface defects currently detected only after machining, and to identify the optimum process parameters to prevent the sub-surface defects occurring in

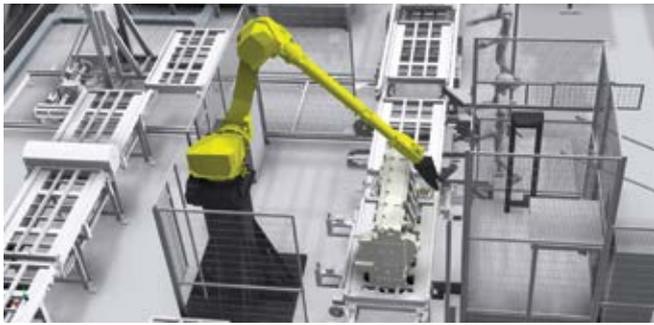
“The corner stone of the project is the programme of automation in the foundry. The Fanuc robots installed by Robotic Innovations have become the workhorse to carry instruments that acquire data while handling or performing its operations. All the data collected throughout the process by the robots and the variety of inline instruments will be linked to specific castings. At the end of the process, the entire set of process parameters including operator information will be available for each casting.”

concept are robotics, process instrumentation, and the tracking of components using RFID and other software applications. With all the data available and it being traceable to individual castings, the door has opened to enable the use of Artificial Intelligence for process control and inspection of components.

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the first place. The current model has a 70% success rate to predict casting defects, based purely on the raw process data. Castings with a high probability of sub-surface defects are identified, and additional inspection and testing is done to prevent the castings from reaching our customers,” continued Du Plessis.

“The results have been astonishing. The biggest challenge now is to keep the process within the very narrow process window that is recommended by the Artificial Intelligence algorithm. On batches where all the process parameters are achieved as recommended, we have seen internal scrap and rework dropping by 90%, and recently this has resulted in three weeks of zero scrap at the customers. Data is continuously fed into the system and new patterns are



After the vent drilling process the core package is assigned a unique sequential number from the production system Shopware. This unique number will be linked to all the data acquired for the core package



The final operation in the core shop is the palletising of the core assemblies prior to storage. For this operation a Fanuc M-900iC robot is used. In future, an instrument will be fitted that carries out a dimensional assessment of the core package

regularly discovered by the Artificial Intelligence software — as it is constantly re-training “itself” as new data is loaded into the system. This results in continuous improvements to the process control, leading to further improving the quality of our products.”

A glimpse into the project to become a Smart Foundry

The start of the project is in the Core shop with a Fanuc M-900iC dipping robot linked with automatic coating control systems, supplied by Proservice in Italy. The core drying oven, also supplied by Proservice, acquires data for each core package. Once the core package exits the core drying oven, process data such as coating density and viscosity, drying time and temperature in each zone is available for each core package.

After the drying process, core vents are drilled using a Fanuc M-20iA robot. The robot will, in future, carry instruments to inspect the various cores as well as the core assembly.

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“During the latter half of 2017, Atlantis Foundries will install an off-loading robot at the shot blast machine. In addition to off-loading, the robot will use the spare cycle time to perform fettling of the front and rear face of the casting.

In order to accurately fettle, the casting’s dimensional measurements of the major features are required. As with other data it will be captured and used by Artificial Intelligence software.”

“Atlantis Foundries have also invested in a Fanuc R-2000iC, which will be used for testing and developing future fettling cells, primarily to be installed in order to alleviate the harsh working conditions required of the current manual fettling processes.”

Visual inspection using Artificial Intelligence

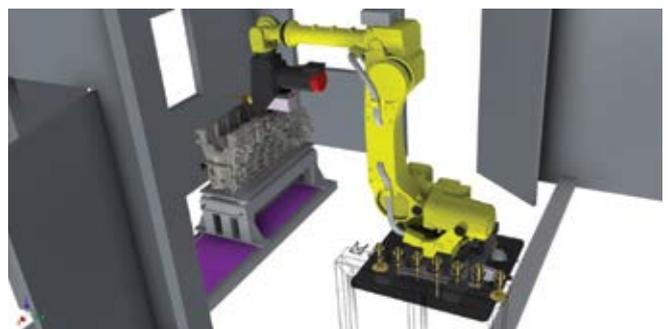
Visual inspection is a thorn in the side of many Quality Managers, where any missed defects on a casting will end up at the customer, resulting in costly rework and sorting exercises. Atlantis Foundries export of all their castings to the USA and Europe, and with these long supply lines, visual inspection failures can be very costly if castings require rework or sorting at the customer. Modern convolutional neural-network based object detectors can process a scene containing many objects of interest, locating each object and classifying them into distinct categories and objects. This technology can be broadly applied; from identifying separate objects in a complex scene, to determining the location and extent of a visual feature.

“In the case of Atlantis Foundries the objective is the same: find the location and size of defects on the surface of the casting and optionally classify and identify the type of defect contained in the regions of interest.”

“This technology was another breakthrough in our process to becoming a Smart Foundry. Not only is process data collected for each casting, but the end result is automatically recorded and the two Artificial Intelligence systems are



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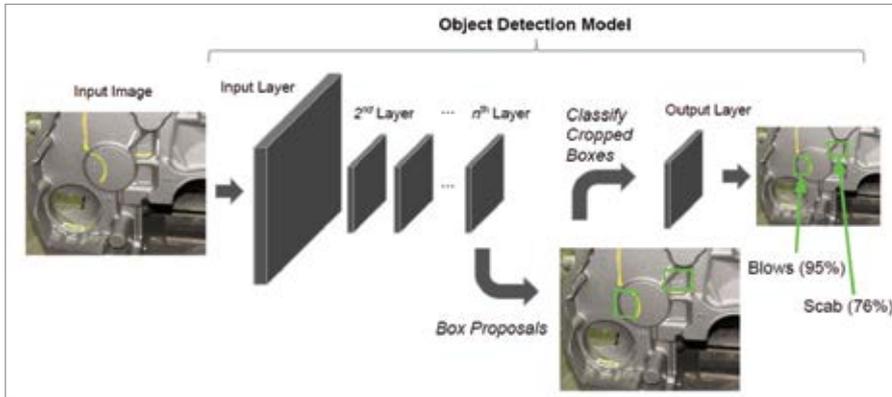


Visual Inspection using Artificial Intelligence



than any single variable correlation.”
 “We first knocked on the door of DataProphet with this problem. How do we find sub-surface defects and what are the process parameters that give us the best results? At the first feedback session with DataProphet, we felt vindicated when Dr Michael Grant (he has two PhD’s) told us that based on 18 months of process and scrap data research, he and his team found no single direct statistical correlation between our process data and our defects. Validation that our intuition about the complexity of the foundry process is correct.”

“Foundry defects are caused by a complex combination of process parameters that varies over time. A sequence-based model was built using state of the art neural network architecture and it was used to determine the combination of process parameters that gave us the best results. DataProphet found the various operating paradigms that our foundry operates in. Each paradigm is described by a range



complimentary; the prescriptive process module predicts defects and their potential location on the casting; and the inspection module visually inspects the castings to verify quality. This enables Atlantis Foundries to prevent a defective casting from being delivered to the customer, and to generate future training data.”

Process control using Artificial Intelligence

Finding the correct process parameters for castings is a daunting challenge for any foundryman. The foundry process is complex and has many separate steps, with each step having many process variables that influence the quality of castings.

“Determining the correct process parameters can be determined by following theory and using simulation software. However, theory and simulation software cannot account for all the process variations in a foundry. As we all know it is a careful balancing act, as one parameter change can solve one problem, only to create a new problem — every parameter has many degrees of influence. Different casting types also require their own unique process parameters based on their design. One approach to find the best set of process parameters is through trial and error, and given error this leads to trials and more trials.

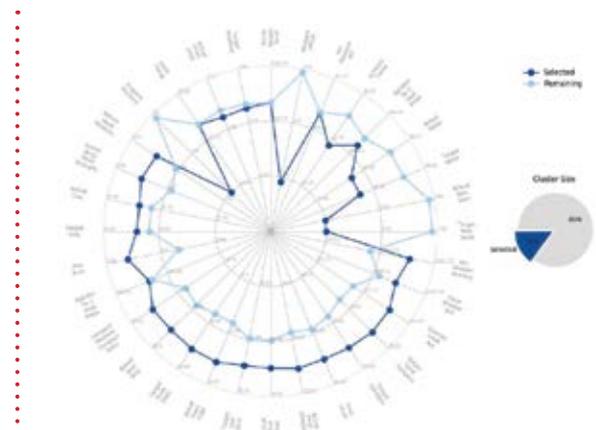
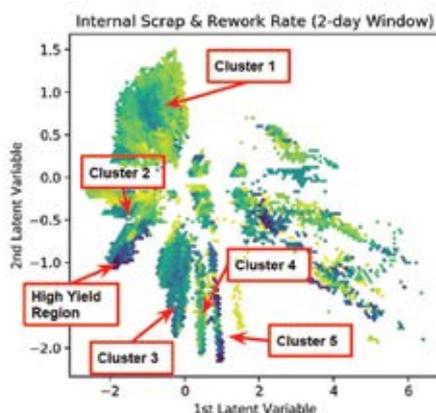
The complex relationship between these many process parameters — and the inherent variation of each parameter — may lead to the incorrect conclusion being drawn from a trial. This problem is far more complex

for each process parameter and each paradigm has a unique yield rate (the rate of good casting to scrap castings).”

“For each high yield cluster, a set of process parameters was established, which provided us with a process window to aim for during production.”

“The results have been astonishing, especially when we are able to achieve the correct combination of process parameters during the production of the castings. The other striking discovery was that the optimum process specification is much smaller than previously thought, very small variations in the process that was historically seen as acceptable have been shown to have a very large impact on the yield rate; while some others that we have been trying to control with precision have been shown to have less impact. The challenge now, is to constantly achieve this very narrow process window. We came to the conclusion that the only way to keep our process within this very narrow window, is to build a Smart Foundry. We believe that Atlantis Foundries’ Smart Foundry will make us the global foundry of choice for complex castings in the future.”

For further details contact Atlantis Foundries on TEL: 021 573 7200 or visit www.atlantisfoundries.com ■





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Budget Sheet Metal experiences 46% growth

Budget Sheet Metal Engineering is a family-run business that specialises in the manufacture of sheet metal parts and finished products.

“Growth in any type of market or industry does not come easily. You have to be innovative, be prepared to spend money on capital equipment to increase and improve your manufacturing capabilities, but more importantly, engage with your client. You have to offer and show them confidence in your service and resolve any issues immediately. There is no such thing as sweeping problems under the carpet and hoping they will go away or having a different agenda or operating in an underhand manner,” says Sietse Walma van der Molen, Production Director at Budget Sheet Metal Engineering.

“We are a business to business sheet metal fabrication company that has an emphasis on process rather than creating products, although today we have the skills, engineering software and equipment to take your concept to finality while protecting your intellectual property,” continued Sietse.

“We use our client’s specifications to brainstorm, model and develop solutions to meet the client’s individual needs. Using the latest 3D Modeling software such as SolidWorks communicating directly with our advanced sheet metal fabrication equipment, we ensure the highest quality standard at an effective cost.”

10 year milestone

“Although the company has been in existence since 1991 our — the current directors — journey with Budget Sheet Metal Engineering began in 2007 when we purchased the company. My brother-in-law Claudio Ferrari, who is a mechanical engineer, his wife Sigrid, who is an analyst, my wife Ketti, who is Claudio’s sister and an economist and myself, an industrial engineer, purchased the business when we needed a change



Installed earlier this year at Budget Sheet Metal was a new Amada HG 1303, a 130-ton, downracting hybrid drive press brake equipped with AMNC 3i intelligent, interactive, and integrated controls and a bend indicator sensor (Bi-S)

from the previous business we owned, which was in the food manufacturing industry,” explained Sietse.

“The 10 years have not been easy with some unforeseen obstacles thrown at us. At the time when we took control of the business it was on a comfortable footing but, for various reasons, struggling to achieve any growth.”

“When we took over we knew there was potential that just needed to be unlocked. Controls, systems and computerisation were implemented to encompass all facets of the business and we began to change the inherited perception that our main focus was manufacturing rainwater components such as gutters and down pipes,” reflected Claudio Ferrari.

“We also took a fundamental decision to have an emphasis on process rather than creating our own products. There are virtually no Budget Sheet Metal products. The company’s strategy is to work with our clients to manufacture sheet metal fabrications to their own specifications and individual needs. I believe that we have achieved these objectives and are now building on a reputation whereby we are recognised for taking a product design idea, improving it and processing the product or component using the multiple, complex operations and skill sets that are now at our disposal.”

Embracing change

“However, there is always room for improvement and Sietse’s trip to Japan to visit the Amada manufacturing facilities earlier this year (2017) showed that in many aspects we are way behind but if we implement what we learn from countries such as Japan we could all prosper.”

Sietse describes what he saw and learnt: “Japan is a very advanced country, especially on the manufacturing side, which was the purpose of our visit. I had previously visited the country and was amazed then, but the country has subsequently not stood



Budget Sheet Metal are innovative in designing products for clients. This example shows how the company has designed and manufactured a mobile trolley to store press brake tooling



An enclosure made for a client

still and has continued to innovate and evolve. It is all about their culture, work ethic and “monozukuri”, which means, ‘making things,’ in the sense of devotion to manufacturing. Specifically Japanese manufacturing.”

“New manufacturing techniques are not only highlighted in the manufacturing process but also in the equipment. It really struck

home on this visit that the path to reducing the machine footprint, while increasing capacity and reducing material consumption, has developed more than I thought.”



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“Equally the use of automation, machine monitoring and data-driven manufacturing was apparent at all levels. To keep Japanese manufacturing moving forward they are constantly innovating and evolving. We have to pay attention and learn from them.”

New equipment

“We have always had this type of thinking in the company but to remain a successful service provider and to stay ahead of the competition you have to continue to invest in the latest advanced technology and always be tuned into ways to make your services increasingly more unique, which usually involves more advanced technological investment and a continual rethinking of how to process components.”

“We are constantly looking at ways of taking out or improving steps in the manufacturing process. With our emphasis on process rather than creating our own products we like to say that we meet and exceed client expectations, which we do by emphasising quality through the elimination of human involvement and variability by the use of advanced technology. If you don't keep an eye on the future – if you take a break from the competitive battle – the future will blow by you with a vengeance.”

“We are always pursuing new clients in diverse markets and chasing manufacturing challenges. This has created a cycle of learning and by doing that it has allowed us to pursue still more challenges,” said Sietse.

“With this in mind in 2016 we invested in a second Yaskawa Motoman HP20D-6 DX100 robot that included a manipulator and SKS power joint robotic welding equipment for tack and welding operations. We purchased this Yaskawa Motoman robotic welder for a specific contract, which involved manufacturing 1 000 insulated stainless steel trolleys. As with the first robotic welder we designed our own table and jigs for this setup. Our research showed that by investing in the robotic welder we could reduce welding time done manually from five hours down to 12 minutes per trolley.”

“However, besides wanting to learn more about the latest technology that Amada has to offer and is used for

cost savings and quality, we had a wish list to upgrade in our press brake department. Installed earlier this year was a new Amada HG 1303, a 130-ton, downacting hybrid drive press brake equipped with AMNC 3i intelligent, interactive, and integrated controls and a bend indicator sensor (Bi-S). Mission accomplished.”

“We have also invested in the VPSS 3i software, Amada's newest generation of a fully automated and highly efficient programming system for sheet metal processing.”

“With the VPSS 3i Blank, Bend, Robot and Weld Solution Packs you have everything you need to prepare laser, bending, punching and punch-laser combination programmes externally. The requirements on design and production vary widely in sheet metal production. That is why it is all the more important to be equipped with all the essential tools that will allow you to optimise programming processes.”

“In between we have also been upgrading our tooling from HFE tools to rotational tooling and we also purchased a 100 ton eccentric press.”

More involvement with clients results in 46% growth

“Besides the results that have emanated from investing in equipment and our processes one of the primary reasons that we experienced a 60% growth in 2016 has been our ability to become more involved with the production and assembly of clients' products. We are no longer a company that only offers cutting, bending, punching and welding of sheet metal. We have taken the process further.”

“For example, an enclosure that we manufacture for a client requires powder coating, monitors and other equipment to be installed and secure locks to be fitted. We now source all of the extra components and equipment, in consultation with the client, get the metal finishing done and then assemble. They are now able to come to us and get a complete service – from design to final assembly.”

For further details contact Budget Sheet Metal Engineering on TEL: 011 792 5981 or visit www.budgetsheetmetal.co.za



Budget Sheet Metal have also recently invested in a second Yaskawa Motoman HP20D-6 DX100 robot that included a manipulator and SKS power joint robotic welding equipment for tack and welding operations. This Yaskawa Motoman robotic welder was purchased for a specific contract, which involved manufacturing 1 000 insulated stainless steel trolleys



Budget Sheet Metal have recently invested in a 100 ton eccentric press

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BMW Group South Africa invests another R160 million to increase production capacity of the BMW X3 at its Rosslyn plant

BMW Group South Africa has announced that it will invest an additional R160 million into its Rosslyn manufacturing facility outside Pretoria to enhance production line speed. The enhancement raises the maximum production capacity by almost 10%, from 71 000 units to 76 000 units, leaving the plant with a potential to produce the highest volume of units ever in its 44 year history in the future.

The additional investment comes on the back of the R6 billion investment that was announced in November 2015 for the preparation of the Rosslyn plant to produce the new BMW X3. Production at the Rosslyn plant will

transition from the 3 Series to the X3 in the first half of 2018. Interestingly, the new X3 will be produced for the local market and later also exported to Europe.

“We are greatly encouraged by the amazing performance of our BMW X-models around the world. This growth trend supports our decision to produce the BMW X3 in South Africa. The potential for the future is exciting as ultimately production volume is determined by global demand for our products,”



Production at the Rosslyn plant will transition from the 3 Series to the X3 in the first half of 2018. Interestingly, the new X3 will be produced for the local market and later also exported to Europe

said Tim Abbott, CEO BMW Group South Africa and Sub-Saharan Africa.

The BMW X-models, part of BMW's Sports Activity Vehicle (SAV) range, accounted for more than 30% of total global sales for the brand in 2016. The BMW X3, in turn, accounted for more than 24% of the global BMW X-model range.

BMW Group South Africa is now becoming a part of the global BMW X-model success story. BMW Plant Spartanburg in the USA will continue to produce the BMW X3 for their local market and export markets.

Plans to create a centre of production excellence at the company's Rosslyn Plant is well under way with the largest infrastructure upgrade in the history of the facility completed and staff upskilled in state-of-the-art technologies. Supplier development and localisation strategies are in progress, and the company is confident that the



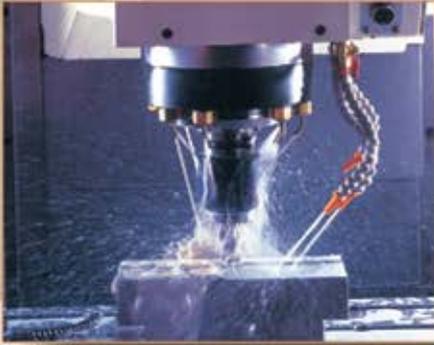
The Rosslyn Plant consists of only one final assembly line



The plant is very compact and congested. The possibility of first erecting a new building adjacent to the existing Building 50 and thereafter demolishing the existing Building 50 was not an option. The only option therefore was to erect a new roof structure over the existing Building 50 whilst the assembly plant remained operational



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The BMW X-models, part of BMW's Sports Activity Vehicle (SAV) range, accounted for more than 30% of total global sales for the brand in 2016



The company used an innovative method based on bridge building methods to raise the assembly roof while production continued as normal below. The roof lift project won an award at the recent Southern African Institute of Steel Construction

BMW X3 will be more localised than the current BMW 3 Series.

Roof infrastructure upgrade

One of the infrastructure upgrade projects BMW South Africa had as part of the BMW Plant Rosslyn investment was revamping the existing assembly line to accommodate the larger size of the BMW X3 (as compared to the BMW 3 Series). The company used an innovative method based on bridge building methods to raise the assembly roof while production continued as normal below. The roof lift project won an award at the recent Southern African Institute of Steel Construction.

When asked about the BMW H-EMS Roof Lift project, Amanuel Gebremeskel, technical director of the SAISC said, "I think it's rare that you get a challenge of this type, in engineering terms as well as fabrication and erection terms. It's a very risky project, which they have pulled off spectacularly."

Building 50, known as the assembly building at BMW

Rosslyn is about 60 years old and consisted of a low saw-toothed profile roof supported by numerous columns at close spacings. In 2018, BMW Rosslyn will produce the X3 model instead of the 3-Series and the latest assembly line technology necessitated that a 4 100m² portion of the current B50 structure be modified. The proposed system, H-EMS (Heavy Electric Monorail System), comprises overhead conveyors fixed to the roof, with height-adjustable hangers that carry the vehicles being assembled. The roof and column structure of the existing assembly building was inadequate for this purpose. The H-EMS system required a higher and stronger roof structure with fewer columns.

The Rosslyn Plant consists of only one final assembly line, and since the plant is very compact and congested, the possibility of first erecting a new building adjacent to the existing Building 50 and thereafter demolishing the exiting was not an option. The only option therefore was to erect a new roof structure over the existing Building 50 whilst the assembly plant remained operational.

BMW Group South Africa growth plans for the future includes investment in several business areas.

BMW Group South Africa has had a presence in South Africa for nearly 45 years, contributing to the upliftment of the country and its people. The company continues its passion for South Africa, with future plans including investment into several areas of the business.

Examples of this are the R400 million expansion of the Midrand Headquarters and doubling the size of the regional parts warehouse, as well as doubling the local Information Technology function, in an increasingly digitalised world, to nearly 800 staff. ■



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Rheinmetall Denel Munition to make major investments to upgrade its facilities

Rheinmetall Denel Munition (RDM) will invest R550 million over the next three years to modernise its production facilities to the latest standards, introduce state-of-the-art processes and to increase its capacity, company CEO Norbert Schulze informed Engineering News Online recently.

"We will likely recruit another 200 workers," he also said.

RDM is 51% owned by Germany's Rheinmetall AG and 49% by South Africa's Denel SOC, both of which are defence industrial groups (although Rheinmetall is also active in the automotive components sector). Rheinmetall is a private sector enterprise and Denel is State-owned.

"We are a South African company, despite our financial ownership by a German group," he points out.

"We have only two Germans in the company; all our other people are South Africans. We have facilities on four sites in South Africa, which we are constantly upgrading and modernising. These investments remain in South Africa and we cannot move them out of the country."

RDM was created in 2008 when the then South African



A symbolic picture of 155mm munition manufactured by Rheinmetall

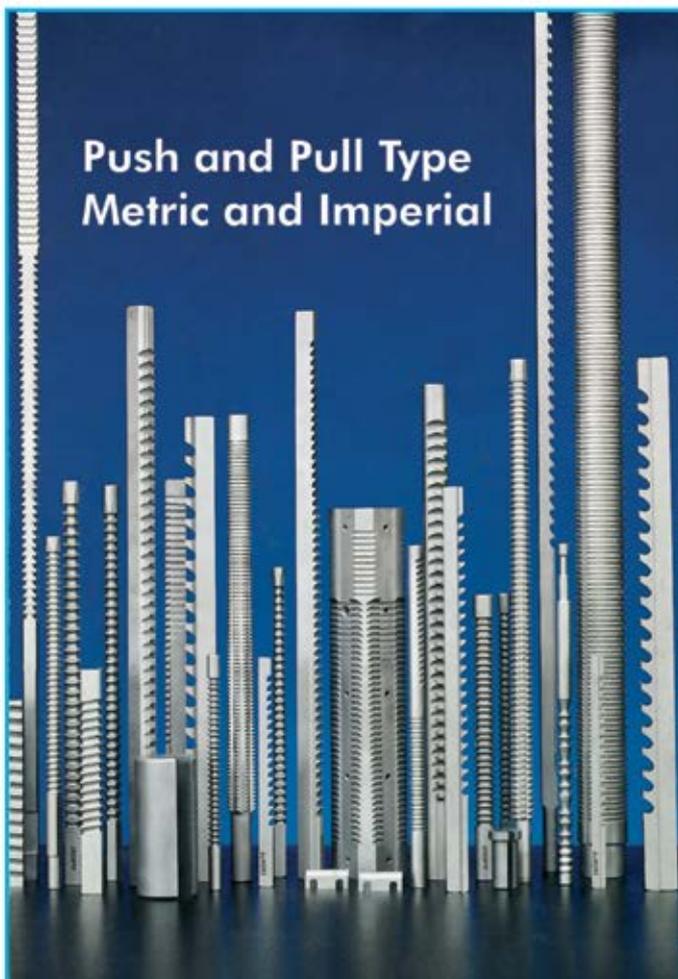
government decided to sell a majority stake in Denel's loss-making pyrotechnics business (shells, bombs, grenades, rocket motors and missile warheads) to a strategic partner. Rheinmetall was the successful bidder. The German group subsequently made major investments into its new, South African, subsidiary.

"That decision has benefitted the country, benefitted the economy, created 2 000 direct jobs and 10 000 indirect jobs among our suppliers," highlighted Schulze. "We buy nearly everything in South Africa, nothing is imported."

RDM pays about R50 million in dividends every year, half of which goes to Rheinmetall in Germany and half to Denel. But the company also reinvests about R200 million every year into its activities and infrastructure in South Africa, including training and development as well as product enhancements and innovation.

"Relations with Denel, our minority shareholder, are excellent," he observed.

"They leave us to get on with our job and we have very good relations with Denel's businesses, such as Denel PMP, Denel Land Systems and Denel Dynamics." ■



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Caterpillar commits to local sourcing of components through R1.3 billion investment

Caterpillar, a leading US manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives has said it is to source components and related services in South Africa worth a total estimated value of R1.3 billion. The commitment is for a period of 10 years, in support of local enterprise and supplier development.

Caterpillar sells its equipment locally through Barlworld Equipment.

The investment deal was announced as part of government's Equity Equivalent Investment Programme (EEIP), which falls under South Africa's broad-based black economic empowerment (BBBEE) legislation, which allows multinationals to earn ownership credit without actually selling shares to black shareholders.

The EEIP instrument is available to those firms and original-equipment manufacturers (OEMs) that were unable, owing to corporate restrictions, to sell shares to meet their empowerment obligations.

It is reported that the Caterpillar deal is the ninth equity-equivalent investment deal and Caterpillar Industries MD Zakieya Parker described its largest-ever equity-equivalent investment concluded to date and also one of US group's largest investments in Africa. Caterpillar has been present in the South African market for 90 years, having first signed a dealership agreement in August 1927.

The deal is also part of the previously announced plan of Caterpillar, its independent dealers and the Caterpillar Foundation to invest more than \$1 billion in countries throughout Africa over five years.

Parker said the programme comprised five integrated and interdependent components: Local and supplier development, enterprise development, localisation of component content, skills transfer and development and job creation. Parker said localisation opportunities Caterpillar was looking at included sourcing component locally to support the mining, construction, energy and transportation industries.

At the ceremony, attended by Trade and Industry Minister Rob Davies, he said equity-equivalent investments were not government's preferred empowerment option, with the amended BBBEE codes placing emphasis on black ownership and control.

The EEIP programme is a clear indication from government that it intends to put pressure on international companies doing business in South Africa. Government has also recently announced that it would be phasing in a stipulation that all recipients of government incentives, such as the automotive OEMs, would have to have a minimum BBBEE rating of Level 4.

One wonders how many international companies will be willing to be dictated to. The exit of General Motors was surely a warning to government, with big red lights flashing. Australia has seen its automotive industry collapse and close down with one of the last, Toyota, shutting up shop in October 2017. From the 1980s, successive Australian governments pursued a policy of "managed decline" by reducing and stopping subsidies. Ironically, at one stage, Australia manufactured roughly the same amount of vehicles per annum as South Africa does today.

The death of the Australian auto industry is expected to tally losses of hundreds of thousands of jobs, and reduce the country's GDP by as much as two per cent. ■

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Mecad launches SolidWorks 2018

Dassault Systèmes recently announced the launch of SolidWorks 2018, the latest release of its portfolio of 3D design and engineering applications. SolidWorks 2018 features an integrated, end-to-end solution for the design to manufacturing process that enables businesses of any size to rethink their approach to how parts and products are made and quickly bring innovative ideas to market in today's experience economy.

Powered by Dassault Systèmes' 3DEXPERIENCE platform, SolidWorks 2018 supports a business' complete design through manufacturing strategy with solutions that simplify the interactions between disciplines across the product development workflow. This unified process leverages smart manufacturing – a connected and seamless flow of data that is available to all teams involved in product development whenever, wherever and in whatever format is needed without having to port data from one system to another.

"Lots of designs involve welding plate and sheet metal parts



Freek van der Berg and Colin Sampson of Mecad Systems with Detlev Borner of Walter Meano Engineering

and most people use 'tab and slot' techniques for self-fixturing the parts for welding," said Edson Gebo, Owner, Digital Detail & Design.

"The new tab and slot feature saves a lot of time versus having to create these features manually. This will really help get designs to the shop faster."

In today's marketplaces, competition is fierce and consumer loyalty is nurtured by businesses that can create compelling experiences that go beyond simply purchasing or using a product. While this

inspires businesses to innovate in all aspects of their operations in order to thrive, obsolete organisational structures, processes and tools separate the design and manufacturing aspects of product development and can lead to mistakes impacting collaboration, schedules and budgets.

With SolidWorks 2018, teams can collaborate concurrently to more rapidly and cost-efficiently design a product or part, validate its function and manufacturability, manage its data and related processes, streamline and automate its manufacturing, and inspect it. Any changes in design or manufacturing are fast and easy to manage and automatically flow to all related models, programmes, drawings and documentation, thanks to intellectual property embedded early on in the design process.

SolidWorks CAM

A key feature of SolidWorks 2018 for this process is SolidWorks CAM, a new application that provides rules-based machining with knowledge capture to allow for the automation of manufacturing programming. Designers and engineers can gain a greater understanding of how their designs are made, make more informed decisions, and quickly create prototype parts and manufacture in-house to control quality, cost and delivery. This application also enables teams to execute new "build to order" strategies with custom parts that are automatically designed and programmed in seconds rather than hours.

"A successful consumer experience must have a well-designed product at its core and an efficient way to produce it. SolidWorks 2018 brings more than just a smarter approach to manufacturing parts or products, it helps businesses translate imagination into innovation and build ecosystems," said Gian Paolo Bassi, CEO, SolidWorks, Dassault Systèmes.

"As with past releases, many of SolidWorks 2018's new tools and enhancements respond to the SolidWorks community's insight and feedback, equipping them with more power and capabilities to bring great designs to manufacturing faster, with higher quality and at lower costs. Over the next few months, we will roll out additional end-to-end process solutions aimed to help the community further improve its business outcomes."

Mecad Systems, SolidWorks' resellers in South Africa for the last 25 years, held one-day seminars around the country to launch SolidWorks 2018. Below are some of the delegates that attended the Gauteng seminar.

For further details contact Mecad Systems on TEL: 012 645 4300 or visit www.mecad.co.za

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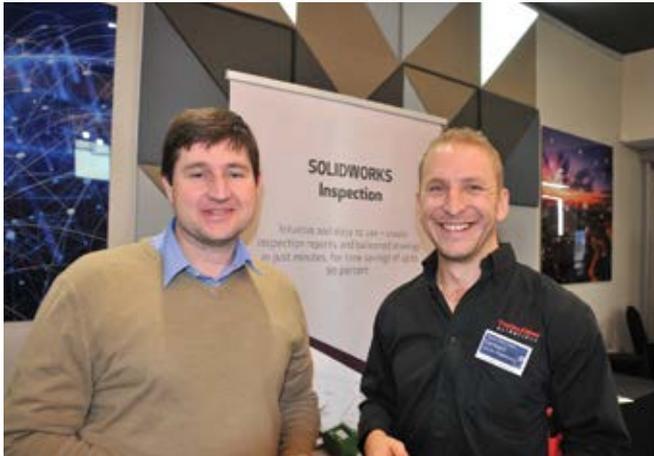
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“The new tab and slot feature saves a lot of time versus having to create these features manually. This will really help get designs to the shop faster.”



**Jochie Lombard and
Gerhard van der Westhuizen,
both of Thermofisher Scientific**



**Bennie Vosloo, Jaco Viviers,
Gregory Mumford, Tyron Greve,
Michael Blackman and Stuart Kirkman,
all of Centurion Systems**



**Robert Pereira of Mecad, Zack Nel
of McWade Productions,
Rico Van Niekerk of Osborn Engineered Products
and Riaan Truscott of B&E International**



**Carel Wilken, Herman Engelbrecht,
Marcus Hoffmann,
Dirk Van der Bank and Vania Betscheva,
all from Saab Grintek Defence**



**Jade Johnston, Carli Hattingh, Silas Mehlappe
and Jaco van Genderen, all of Regent Lighting**



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Equipped with an innovative Multi Purpose Turret, the LC 2515 C1 AJ is a revolutionary punch/fiber laser combination machine that maximises productivity while eliminating secondary operations. The C1 AJ features a highly efficient 2kW fiber laser that achieves faster cutting speeds and a wider range of cutting capabilities compared to a CO2 laser.



Leadership isn't attained through compromise. It's achieved when excellence is the only noteworthy benchmark. Amada's ongoing commitment to maximise your productivity has resulted in machines that set the global standard for speed, precision and performance.

Unwilling to settle for anything less than the optimal fiber laser source, Amada became the first manufacturer to produce its own fiber laser - teaming with JDSU to develop the AJ fiber engine. Unlike other fiber lasers on the market, Amada's AJ series of

fiber lasers and punch/fiber laser combination machines are engineered as fully integrated systems. This comprehensive design approach optimises the inherent benefits of fiber laser technology to ensure maximum productivity and accuracy.

Despite the crowded field of fabrication equipment manufacturers, it's really quite simple. Only one company name is synonymous with leadership.

Amada - second to none.

AMADA

BSI Steel may close KwaZulu-Natal branch

The group may restructure to centralise distribution from Gauteng office amid sector ructions.

BSI Steel, an AltX-listed processor and distributor of steel products into sub-Saharan Africa, is reviewing the viability of servicing the market in KwaZulu-Natal through its Pietermaritzburg warehouse and offices, according to a SENS announcement and a report in Business Day.

The group, which is feeling the ructions in South Africa's broader steel industry, said there was a possibility of relocating the firm's administration function to the BSI Kliprivier office in Gauteng.

But it also said "This restructure is a decisive and progressive move to ensure that BSI remains a competitive distributor in the market". The tone of this statement makes any possible move sound like a done deal.

"It is expected that this restructure will result in an efficient, highly cost-effective distribution platform, geared to meet service and price expectations going forward," the company said.

BSI said due to decreasing margins over the years, it had been "forced to utilise the lowest cost platform to meet market prices. As a consequence, the company has been supplying



a significant and growing portion of steel to KZN (KwaZulu-Natal) customers directly from Kliprivier, which has made the Pietermaritzburg warehouse increasingly redundant." The group described the financial year to March 2017 as "challenging".

"We experienced many unforeseen events. The decision was taken to close the roofing and tubing processing lines. Certain roofing lines remain specifically to complement the product mix for the Namibian market," it said at the time.

The group said steel markets had changed substantially in recent years.

BSI said in a recent trading update that headline earnings per share for the six-month period ending September 2017 were expected to be at least 40% lower than the previous corresponding period.

"We are entering into a consultation phase with our staff to explore options on how to preserve jobs in Pietermaritzburg."

"The outcome of this process will dictate if we retain a KZN footprint or not. In the interim, it is our intention to continue and improve the quality of direct delivery from Kliprivier," it said.

Prospects for the local steel industry have been dire. With a market capitalisation of R209 million, the market pays relatively little attention to BSI Steel.

Marique Kruger, economist at industry body the Steel and Engineering Industries Federation of Southern Africa, said the Reserve Bank's recent decision to keep the repo rate unchanged at 6.75% and the prime rate at 10.25% would stimulate domestic demand and sustain the recent increase in GDP growth.

She said South Africa's producer price index (PPI) for intermediate manufactured goods had shown a decreasing trend throughout 2017, averaging 3.4% during the second quarter, down from 6.8% in the first quarter.

"This leaves very little room for manufacturers to pass cost increases into the market," Kruger said.

"With roughly 90% of the products in the metals and engineering sector being of an intermediate nature, the declining PPI figures are a cause for concern," she said. ■

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New aspects in industrial 3D metrology, inspection and testing conference

GOM to present optical measuring techniques for industrial casting processing.

GOM, a global industrial company that develops, produces and distributes software, machines and systems for industrial and automated 3D coordinate measuring technology and 3D testing, will hold a one day conference on 15 March 2018.

GOM, RGC Engineering have organised with the Metal Casting Technology Centre to hold the conference at the University of Johannesburg, Doornfontein Campus Q/K Building, corner Siemert and Beit Streets, Doornfontein, Johannesburg, Gauteng. Secure parking has been made available in front of the John Orr Building. The conference will take place in the open plan area around G100. To access enter at the UJ Main entrance and park, then walk through the John Orr Building and over the sky bridge that connects to where UJ's Resolution Circle is housed.

This will be the first conference that GOM, based in Braunschweig, Germany, will hold of this type of event in South Africa. However, the company holds its internationally recognised GOM 3D Metrology Conference every second year. Over 600 delegates attend this conference that has been held 13 times and they include representatives from OEMs such as Audi, BMW, Opel, Porsche, VW, Boeing, Liebherr-Aerospace and Rolls-Royce.

The conference is an industrial meeting platform for design engineers, tool makers, production and quality assurance executives, metrologists, foundrymen and experts

from well-known companies and research institutions to learn about the latest developments in optical measuring technology.

Executives from GOM along with their local partner RGC Engineering will provide insight into the use of optical 3D metrology in the casting and foundry industry. They will present examples from the day-to-day practice, show how integrating optical measuring systems into the entire process chain helps you shorten development times, improve production workflows, and thus enhance your company's profitability. Alongside these presentations the GOM Team stage live demonstrations to introduce the latest developments in 3D metrology related hardware, as well as in measurement and inspection software.

New trends in automated quality control as well as recent developments in sensor technologies and software for the entire production process ranging from materials testing through design and toolmaking up to series inspection will also be discussed.

The conference is a must attend for anybody involved in the manufacture or machining of castings. There is no charge to attend.

For further details contact RGC Engineering on TEL: 011 887 0800. Alternatively visit www.rgcengineering.com or www.gom.com



B&R Metrology Solutions equipped for accuracy

Opens showroom to allow prospective buyers to come and view equipment in an operating environment.

“While many companies invest heavily in CNC machine tools and related equipment, the implementation of new metrology strategies tends to happen more slowly. However, today the call for more accountability when manufacturing large or small components is getting louder. In fact it is reaching a crescendo because of ISO requirements, traceability, CE marking and many other regulatory rules and standards that are the norm rather than the exception as they were in the 20th century,” explains Bryn Labuschagne, Sales Director of B&R Metrology.

“Additionally, price pressures and to supply more accurate components are testing even the most competent engineering companies.”

“For these reasons manufacturing companies are having to rethink their metrology plans and in many cases are having to fast track their purchases for their metrology departments.”

“On the other hand companies wanting to make purchases of advanced and accurate metrology equipment have been hamstrung in their ability to make decisions on what to purchase. Shopfloor CMM, inspection and metrology technology has advanced a great deal over the years such that highly accurate measurements can now be attained in most environments. That’s largely because today’s devices combine hardware and software elements that cancel out the influence of a facility’s fluctuating ambient temperature.”

“However, unlike machine tool suppliers who will generally have a machine tool and in most cases more than one on their showroom floor to carry out live demonstrations for prospective buyers, metrology equipment suppliers have been reluctant or more accurately reticent to have equipment in stock and ready to show the machines capabilities. There are many forms of measuring and metrology equipment, whether it is hand-held, portable or a stand-alone unit, so you can understand why.”

“Additionally, no two companies are the same and have different requirements when it comes to measuring or inspection.”

“Since its inception B&R Metrology Solutions has focused on supplying cost-effective metrology equipment for the manufacturing industry while providing metrology professionals with the knowledge, confidence and support that empowers them to make the critical decisions required in the role of quality management.”

“We specialise in CMMs, portable inspection, portable scanning, reverse engineering and planar inspection equipment.”



A Nikon Altera CMM with a ceramic bridge is on display at B&R Metrology Solutions' showroom



The Sisma laser welding systems for mould maintenance and repairing moulds, with and without filler material

Equipment on display in new showroom

“We have now taken a bold step to open up a showroom that will allow prospective buyers to come and view equipment in an operating environment. In the past they would either have to make a decision based on viewing a brochure or a video or attending an international exhibition which, as we know, is a costly exercise.”

“Now they can visit our showroom in Sunnyrock, Gauteng and have a hands-on experience of using the equipment first hand. We have decided to have a range of equipment on display that would be applicable to most companies and applications.”

“This includes the Nikon Altera CMM with a ceramic bridge. Altera is a versatile CMM platform with a wide range of standard sizes and choice of probing technology to suit every application and budget.”

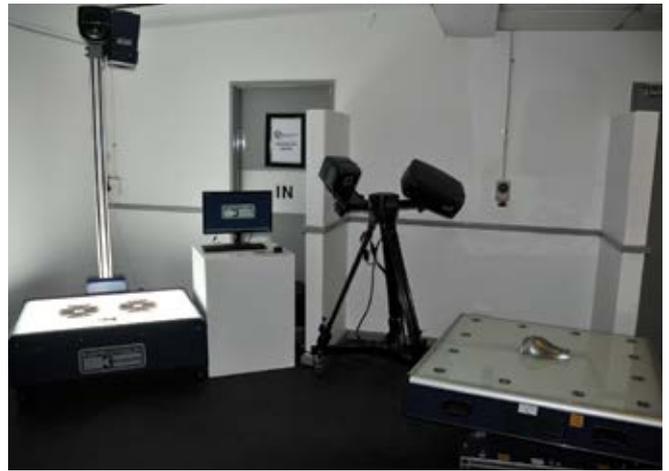
“On show we also have a Nikon MCAx portable articulating arm, The MCAx manual coordinate measuring arm is a precise, reliable and easy-to-use portable 7-axis measuring arm.”

“One of our exciting new age products that is also on display is the Inspecvision Planar sheet metal inspection equipment. The Planar is used primarily in the sheet metal and gasket industries to measure flat patterns, but it is capable of measuring any 2D parts that are opaque or even translucent. The measurement data can be used for quality control to generate complete inspection reports, or it can be used to create a DXF/DWG for reverse engineering applications.”

“The system can be used for very quickly measuring or reverse engineering flat parts that have been manufactured on laser, plasma and water jet cutting systems, as well as punched and some stamped parts.”



Shadow graph machines, optical comparators and Nikon portable articulating arms can be viewed in the showroom



Inspection Planar sheet metal inspection equipment is also on display

“There are also shadow graph machines and optical comparators. On the Renishaw side we have the latest version of the Equator, a high-speed comparative gauge for inspection of medium to high volume manufactured parts, as well as other Renishaw probing and inspection products.”

“Not quite on the metrology or measuring side is the Sisma machine. Sisma offers several laser welding systems for mould maintenance and repairing moulds, with and without filler material. The laser parameters are managed through a practical and intuitive touch screen that allows you to manage the waveform, the diameter of welding and any rotating spindle.”

“The motivation to set up a showroom focusing on metrology, inspection and measuring systems came from the realisation that, not only was there a need in the industry for such a venue but also the importance of these disciplines in industry. All too often this side of the manufacturing process is taken casually.”

“B&R intends to show the market that we are serious about being a major contender in the metrology market and have committed to bringing high end, new age technology back into South Africa.”

For further details contact B&R Metrology Solutions on TEL: 082 852 6371 or 072 392 4934 or visit www.brmetrology.co.za ■

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Harcliff gears up with CNC grinding

Harcliff Mining Services has invested in one of the largest Höfler Klingelberg gear-grinder machines in Africa.

Harcliff Mining Services is a specialist engineering and manufacturing company servicing the mining and minerals sector and other heavy industries. The focus of the company is design, engineering, manufacture, spare parts, maintenance and refurbishment of new and existing equipment. It offers grinding mills and components, scrubbers, open gearing, kiln and drier components, industrial gearbox rebuilds, Radicon, Benzlers, Elecon and Kumera gearboxes and drives and crusher wear and mechanical spare parts.

“Grinding gears to exacting standards forms a sizeable percentage of the mix of machining that is done in our facility in Meadowdale, Germiston, Gauteng. The clients that we service are operating equipment that is used in harsh and rough conditions but still require precision. Up until now our gear manufacturing has been done mostly with manual equipment. The gear hobbors and shapers have performed admirably but they are slow and represent old technology,” said Darren Bagnall, Managing Director at Harcliff Mining Services.

“We can manufacture, repair or refurbish a gear 2 000mm in diameter, one that can weigh up to 14 tons and is used in industrial gear boxes and where open gearing is required. For example this type of work could take up to two weeks, double shift of machining time. Far too long. But more importantly the old technology starts to lose accuracy,” explained Bagnall.



The new Höfler Rapid 2000 cylindrical gear grinding machine, which was manufactured and supplied by the Klingelberg Group's plant in Germany

“The decision was taken to invest in the latest gear grinding equipment and we have just completed the installation and commissioning of our new Höfler Rapid 2000 cylindrical gear grinding machine, which was manufactured and supplied by the Klingelberg Group's plant in Germany.”

“This is a major growth milestone for us and represents a R20 million investment.”

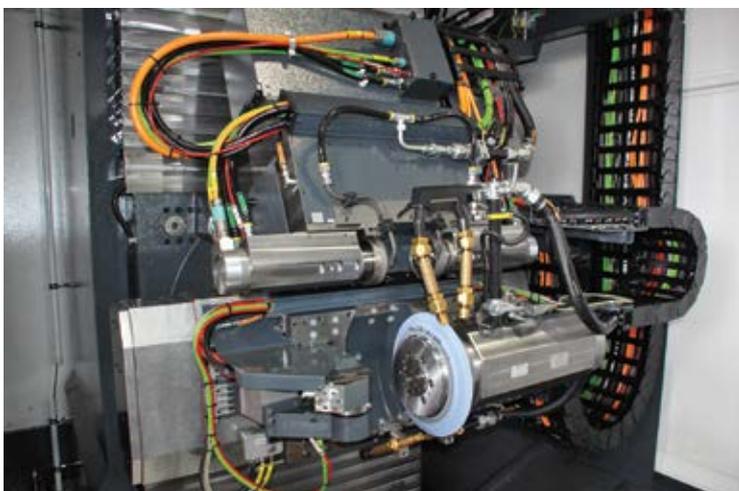
“The Rapid 2000 is capable of achieving the higher accuracy classes of the AGMA (American Gear Manufacturing Association), DIN and ISO standards, well beyond the capabilities of traditional hobbing and gear shaping manufacturing methods, allowing us to manufacture precision gear components and pinions up to 2 000mm diameter and 14 tons in weight with a module range of 1-50. Another significant advantage of this technology is that we can achieve vastly reduced manufacturing cycles in comparison to the traditional methods, allowing us to offer reduced turn-around times to our customers.”

“We are now looking at two shifts for the example I was referring to earlier.”

“The superior surface finish of the tooth flank and root fillet achievable with the Höfler is also important to us,” adds Graeme Kneale, Technical Director at Harcliff Mining Services.

“The root bending and flank pitting service factors for the gear design are directly related to the surface finish of the tooth and root, which is critical to the service life of rotating gears which undergo millions of stress cycles,” explains Kneale.

“The in-board testing head is capable of measuring to



Inside the new Höfler Rapid 2000 cylindrical gear grinding machine



The machine also has a highly flexible direct-drive 5-axis grinding head and allows for swivel angle adjustment during the grinding process



The Höfler Rapid 2000 is suitable for workpiece diameters of up to 2 000mm



The Rapid 2000 is capable of achieving the higher accuracy classes of the AGMA (American Gear Manufacturing Association), DIN and ISO standards, well beyond the capabilities of traditional hobbing and gear shaping manufacturing methods

the nearest 0.1 micron and generating detailed tooth geometry inspection reports including tooth profile, lead, pitch and span measurements, which greatly complements the quality assurance aspect of our manufacturing process. It's an important step for us and we're proud to be able to offer the latest technology to our customers," added Darren Brown, Divisional Director for Harcliff Technical Services.

"The Höfler Rapid 2000 is suitable for workpiece diameters of up to 2 000mm. With standard features that include a cast polymer machine bed, a torque motor-driven machine table, an integrated inspection system, a sturdy grinding spindle, and a dressing system for frequent profile modifications, it is the perfect solution for our cylindrical gear manufacturing. Technologies such as high-speed grinding and best-fit grinding help to reduce manufacturing and delivery times dramatically," continued Brown.

"The machine also has a highly flexible direct-drive 5-axis

grinding head and allows for swivel angle adjustment during the grinding process."

Harcliff Mining Services is an engineering and manufacturing company that currently operates predominantly in the mining and minerals sector, but is broadening its focus to include power generation, the cement industry, materials handling applications, and other heavy industries where large gearing and splining is required. Harcliff Mining Services is a member of the AGMA and is ISO 9001:2008 accredited.

Harcliff Mining Services offers grinding mills and components, scrubbers, open gearing, kiln and drier components, industrial gearbox rebuilds, gearboxes and drives and crusher wear and mechanical spare parts to OEMs and to end-users. The company has manufacturing capabilities in Asia and local representation of European OEMs.

For further details contact Harcliff Mining Services on TEL: 011 392 1714 or visit www.harcliff.co.za



The superior surface finish of the tooth flank and root fillet achievable with the Höfler is also important



The root bending and flank pitting service factors for the gear design are directly related to the surface finish of the tooth and root, which is critical to the service life of rotating gears which undergo millions of stress cycles

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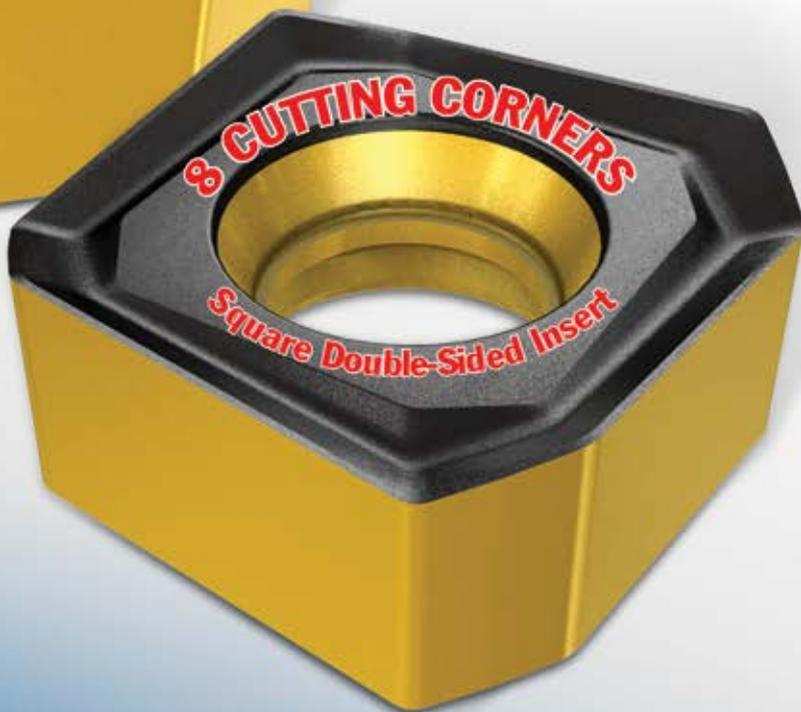
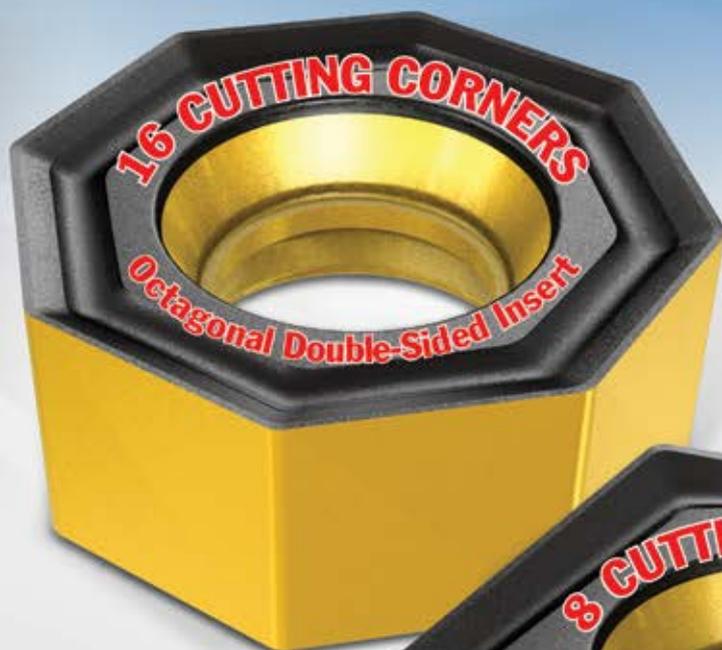
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Esteq launches Solid Edge ST10

New release offers robust enhancements for design, simulation and collaboration.

South African reseller Esteq introduced the newest version of Solid Edge — ST10 — at a function at the CSIR, revealing a handful of improvements, including the introduction of convergent modelling (the ability to mash up mesh and b-rep). The release also offers the ability to scale parts models and provides correct modelling of holes across bends in sheet metal.

The latest release of Siemens' Solid Edge® software (Solid Edge ST10) brings every aspect of product development to the next level with new design technology, enhanced fluid flow and heat transfer analysis and cloud-based collaboration tools. Improved publishing tools enable the creation of interactive technical documents and the ability to share designs in the cloud. Solid Edge ST10 now makes it much easier to optimise parts for additive manufacturing (AM) and obtain quotes, material selection and delivery schedules from AM service providers. Newly integrated topology optimisation

technology, combined with Siemens' exclusive Convergent Modeling™ technology, enables designers to dramatically improve product design efficiency and streamlines the ability to work with imported geometry.

"We import many 3D models for components like lamps and cushions in a faceted format," said Ricardo Espinosa, R&D Engineering Manager at Kimball International.

"The new Convergent Modelling technology that underlies Solid Edge ST10 will enable us to work faster and more flexibly with this data."

Expanding beyond traditional CAD capabilities, Solid Edge ST10 now offers a complete portfolio of tools to improve product development and design. New topology optimisation technology, a subset of automated generative design, quickly optimises the strength to weight ratio of individual part designs. Convergent Modelling greatly simplifies the ability to work with geometry consisting of a combination of facets, surfaces, and



Ethienne Botha and Anton Willemse, both of KSB Pumps and Valves with Rudolph Greyling of NECSA in the centre



Louis Joubert of Xtemp, Pieter du Plessis and Lislé Hansen, both of Esteq and Pieter du Plessis of Sngari



De Wet Pienaar and Ivan le Roux, both of Gammatec with Buks Coetzer of Prototeq



Tim Frie of CAD Partner with Ryan Earle of Esteq

solids – such as those created by importing third-party CAD files or through topology optimisation. New simulation capabilities such as fully-integrated fluid flow analysis eliminate the need to transfer data between different applications, giving designers the ability to achieve accurate and fast fluid flow and heat transfer analysis directly in Solid Edge.

Enhancements to integrated computer-aided manufacturing (CAM) enables efficient programming of CNC machine tools, and the ability to define complex sheet metal components, optimised for manufacturing. New additive manufacturing tools enable users to 3D print parts in house or access a network of additive manufacturing services, optimising material selection and delivery.

Solid Edge ST10 also includes enriched publication features to quickly create detailed illustrations of designs. Publishing interactive digital documents can help communicate the correct manufacturing process and maintenance procedures for products. These documents are associative to the original design information, enabling rapid updates to the documentation when the design changes. New enhancements to built-in Solid Edge data management and improved integration with



**Erik Zimmermann of Zimtek Consulting
with Marius Zwemstra of Novitek**

Siemens' Teamcenter® software delivers scalable product data management to help companies of all sizes become digital enterprises. Component classification and off-line working are now supported for Solid Edge using the embedded Teamcenter integration.

The Solid Edge portal will offer a cloud-based solution to collaborate with other users, suppliers and customers, simplifying communication in product development cycles. Offering a new way to work cooperatively, the portal allows users to upload and manage

files in cloud-based folders, with multi-platform browser-based viewing of Solid Edge and many other popular CAD applications.

“Digitalisation is leveling the playing field, providing unlimited opportunities for small-to medium-sized businesses to disrupt industry,” said John Miller, Senior Vice President and General Manager at Siemens PLM Software.

“The release of Solid Edge ST10 provides a portfolio of next generation product development tools that will enable our manufacturing customers to fully collaborate in the digital economy.”

For further details contact Esteq on TEL: 012 809 9500 or visit www.esteq.co.za

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Own your market. Precision is a mindset

Management of National Stainless Steel Centre calls itself one of the largest independently owned stainless steel and alloy metal processing and value adding centres in South Africa. They specialise in stainless steel, duplex, super duplex and high alloy steel processing. With stainless steel making up 90% of the 500 to 700 tons of metal that the company processes every month, it would be hard to dispute this fact. Creating a niche such as the one that National Stainless Steel Centre has certainly gives the company many advantages over others, especially as stainless steel processing requires a bit more attention, expertise, technology as compared to carbon steel.

“We are more than a stainless steel service centre cutting metal to size. When we established National Stainless Steel Centre nine years ago we knew we had to stand out from the rest. At the time many companies processing flat sheet and plate were finding that they had to offer some level of additional value added services to help them stand out among other metal processors. But we needed to be even more recognisable in a competitive and growing industry. This is one of the reasons why we chose to concentrate on stainless steel, high alloys, duplex and super duplex, with the latest processing technology available to the discerning clients” explained Managing Director Mischel Frljak.

“Being very client orientated many of them request us to process alternative materials so we are not exclusively concentrated on stainless steel. Metals such as mild steel and aluminium make up 10% of our turnover and tonnage



Partners Ivan Obadic and Mischel Frljak

processed monthly so we are not about to neglect this side and we welcome the diversification in these tough economic times.

Both Mischel and fellow director Ivan Obadic now have over 30 years of combined experience having cut their teeth on the shopfloor of a well-known processor that was ultimately taken up by a corporate.

“We were happy when we worked as an owner managed privately run company. However, It did not suit both of us to be part of a corporate once the restructuring took place, which ultimately led to the establishment of National Stainless Steel Centre. Besides focusing on stainless steel we wanted to start off with a company that would be recognised for its freshness ▶



In November 2017 National Stainless Steel Centre are taking delivery of their sixth machine, which is a Bystronic 10 kilowatt laser

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and uniqueness and as alternative supplier to the stainless steel industry. Ivan and myself were and still are relatively young so we have the energy to further develop National Stainless Steel Centre as a world class processor,” explained Mischel.

“Today we are realising that dream/strategy by being more than a one stop shop – we rather see ourselves as a turnkey operation “one stop stainless

steel shop” that in many instances delivers a packaged product to site, most importantly to the discerning clients requirement. This statement is backed up by the new development in the company whereby we are now delivering our own NSSC range of retail products to the Massmart Group for the retail public, including Makro, and are soon to be listed with Outdoor Warehouse and Pick n Pay. Dealing with the retail chains you have to be on your game, where service is key and delivery cannot be compromised,” said Mischel.

“From the beginning we have been versatile in all aspects of the business. We might only have started off with one CO2 Trumpf 3kW laser, one Trumpf 180 ton press brake, a high definition plasma and a shear, but it still gave us flexibility in the services we offered, ensuring the business developed around our clients’ requirements.”

“This has now grown to include both CO2 and fibre laser cutting options, high-definition plasma cutting, guillotining, water jet cutting, bending, rolling, pre-fabrication, welding, CNC machining and drilling, polishing, levelling and deburring of stainless steel, and the list is endless as you would find on our upgraded website.”

“More recently we have added tube bending and robotic welding to the list of services that we offer. On top of that we will in future be offering precision grinding and deburring and



Both the new BySprint and the 10kW ByStar Fiber are fitted with ByTrans material handling equipment

polishing of flat sheet components when our Timesavers machine is installed in February 2018.”

“These are all value-added services that have been added to custom-fit our clients’ requirements. It also fits into our philosophy of continuing in our efforts to be as different as possible from competitors. It’s mandatory. That’s life as an independent.”

“We operate in most spheres of industry that require our services including chemical, engineering, water, sanitation, construction, architectural, oil and gas, rail and carriage, automotive, agriculture and food and beverage but with a bias towards mining and petrochemical. We are happy that we are spread over the broad spectrum because when one has difficult times the other starts to prosper.”

“Our wide spectrum of stock includes a range of all locally manufactured grades of stainless steel in 304L, 316L, 3CR12, and numerous other high alloy grades, including standard and custom size decoiled plates. Our international network of suppliers provides us with exotic material in various grades of stainless steel plates, coils, pipes and tubing, not available locally and fully customised for our clients’ requirements and can also be project based supplied.”

“Besides the numerous different blanks and shapes that we process some of the other products we process include liner plates, liners, flanges, coils, pipes, rings, angles, channels, flat bars, cones, square to round, lobster backs, floor plates, tubes including architectural and many other shapes requested by clients.”

From drawing to profiling to site

“We pride ourselves on the fact that a client can present ▶



In September 2017 National Stainless Steel Centre installed a Bystronic BySprint 3015, which has a bed size of 3 x 1 metres



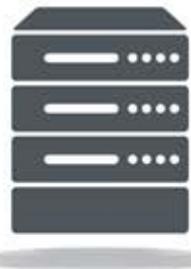
National Stainless Steel Centre has four Trumpf lasers on the floor

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National Stainless Steel Centre is more than a stainless steel service centre cutting metal to size



The company has a six metre Gasparini shear

a scope of supply with a drawing and expect his product to be delivered to site without having to be involved. This will include the welding, and pre-site assembly where necessary. And not unusual these days we also offer CNC machining and milling services. Our CNC machining, milling and drilling are all done in-house, with machining capabilities of up to 720mm in diameter by 200mm in height on our vertical machining center, and 1200mm by 750mm length and width on our Doosan CNC milling center."

"This allows us to carry out milling, drilling and other machining operations to cut to size material and then assembly if required by our clients on all the components, including welding where necessary, by our certified welders, as well as many other processes being offered. In other words we are more than a cutting and bending operation. We rather regard ourselves as project managers, expediting orders from your general cut to size requirements right up to your big tonnage project based requirement."

"All of this needs to be controlled so that we stick to our promise of 100% delivery, as well as keep up our efficiencies.

We have invested hugely in our software systems for quoting, tracking and monitoring of daily sales orders and project software such as the SigmaNest MRP system, which integrates all of this data for us and is able to give us the immediate answers we need. The result is we are now a fully accountable operation on processing and administration, which fits in perfectly with our TUV ISO 9001 certification, Level 3 BBEE under the new codes and we offer the recognised certification and standards for all the processes that we have to offer."

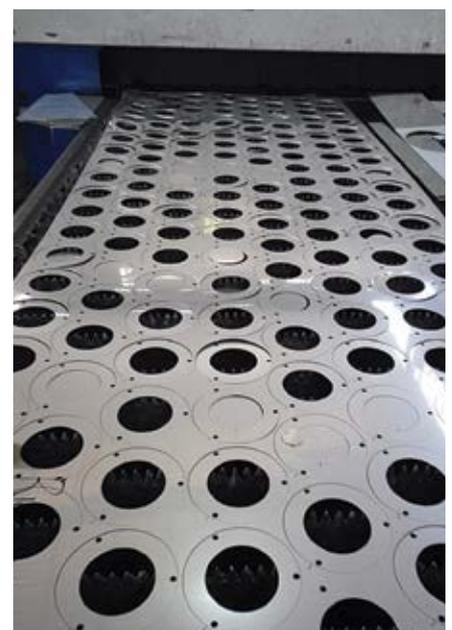
Equipment

"All this requires the necessary equipment and as mentioned before, we have invested in equipment that covers virtually every operation in our industry with very little sub-contracted out. Operations such as finishing for our 3cr12 products will be shopped out but who knows, in the future, we could have our own paint shop!"

"We now have five lasers on the floor and in November we are taking delivery of our sixth machine, which is a Bystronic 10 kilowatt laser that is going to accelerate our



National Stainless Steel Centre have recently installed a second Fanuc welding robot



National Stainless Steel Centre chose to concentrate on process stainless steel, high alloys, duplex and super duplex with the latest processing technology available



More recently the company has added tube bending — a Soco SB-63 auto



National Stainless Steel Centre also carries out polishing on a Weber

cutting process beyond what we could envisage a few years ago. The cutting speeds of the ByStar Fiber with the 10 kilowatt unit increase by up to three times when compared to the industry standard CO2 lasers. This allows users to cut three times as many parts from sheet metal in the same amount of time as the majority of their competitors. The greatest benefits allow users to process material from 0.8mm to 16mm in thickness. Even in higher sheet thicknesses up to 30mm, the 10 kilowatt fiber laser goes full steam ahead of it's own accord."

"To do so automatically, without operator intervention, Bystronic integrated the Spot Control function into the cutting head. This newly developed function configures the laser beam. Spot Control accurately adjusts the focal point of the laser beam according to sheet thickness and material. As a result, the ByStar Fiber always achieves optimal machining quality in varying sheet thicknesses and cutting materials, including stainless steel."

"The new 10kW Bystronic ByStar cutting system is going to set new benchmarks in laser cutting at our company. ▶

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The high-performance equipment is capable of cutting aluminum and stainless steel up to 30mm thick, mild steel up to 25mm, 15mm brass, and 12mm copper. It can also clean-cut mild steel up to 15mm thick, which is beneficial to customers who require an oxidation-free edge on their parts."

"The bed size of this machine is 4 x 2 metres. In September we added the Bystronic Bysprint 3015, which also has a bed size of 4 x 2 metres. Both of these machines

are equipped with the latest Bystronic ByTrans loading/unloading materials handling equipment."

"These two fibre cutting machines have been added to the floor purely because we had filled capacity on our Trumpf machines. It was only two years ago that we installed a 6kW Trumpf TruLaser 5060 with a bed size of 6 x 2 metres, such has been the growth in the company."

"On the press brake side we still have our original press brake and have recently have installed a new six metre Trumpf TruBend 8500 that has a 5 000kN bending force and two Trumpf TruBend 3120 press brakes for light gauge materials."

"Another recent investment has been in a second Fanuc welding robot, installed by Robotic Innovations."

Free flowing manufacturing facility

"The company started its life in a 2 000m² facility in Jet Park, Gauteng with only four staff and that included Ivan and myself. We are very hands on people and come from the shopfloor so we were comfortable operating the machines and any general hands on requirements. The company grew steadily and before we knew it we were up to 80 staff and bursting at the seams."

"Four years ago we moved into our own building that is made up of 10 000m² for processing another 1 000m² for



The company has two Trumpf TruBend press brakes and in total three Trumpf press brakes

office space in Pomona Road, Kempton Park in the vicinity of the new high-tech Aerotropolis area that has been created near OR Tambo Airport. Currently we have all the space that we need but it is filling up fast."

"We do have room for a further 24 000m² expansion but more importantly the move gave us process flow and the resulting efficiencies that were desperately required for a growing concern. We have also been able to increase our staff

complement and we now employ more than 170 staff."

"Included in the new building is a MERSETA accredited training facility and we are now training artisans and boilermakers — every year. This is both beneficial to our company and to the manufacturing industry as skills will be the make or break of all businesses in the future. Besides, we are proud to be able to give back skilled and competent tradesmen and women to the stainless steel engineering industry."

Retail product development

"We are not a company that can sit still for long. We are always looking for the next phase of development and although this one is completely new to us it still fits into our mix. It certainly does not detract from the stainless steel processing, which is the core of National Stainless Steel Centre."

"As we all know South Africa is made up of people that love the outdoors and enjoy having fun with sports, cooking and other outdoor activities. Prime amongst this is the time spent over and the bragging about individual braais (barbeques). From spit-braais to potjies, shisa nyama and snoek braais South Africans love getting together around a fire to cook some food, share some fellowship and more. All over South Africa there are braai buffs and grill enthusiasts who profess to being the best at our national pastime before the social occasion



National Stainless Steel Centre have a high definition plasma to cut thicker material. Other operations are carried out in the machining department



Some difficult to bend components

takes place, and even more so once a few alcoholic beverages have been consumed. We all have our own theories and methods, which have grown out of the many cultures and foods available in South Africa. We even have a National Braai Day and a TV programme Ultimate Braai Master. Industries have been born with the many and varied braais, accessories, sauces, tools and implements that are available for us to purchase. And as they say every braaier worth his "World's best cook" apron wants the best accessories."

"We had noticed that the amount of inferior product that was being imported from all parts of the world was gaining momentum. When it comes to braai accessories South Africans want quality and what is stainless steel? A quality metal that is sturdy, long-lasting and can be developed into a product that is aesthetically pleasing."

"This was the motivation behind National Stainless Steel Centre developing its own range of local quality stainless steel products, primarily for outdoor use."

"The Fire Fryer is an all-in-one pan that can be used on the grill, braai, 3 and 4 gas burner braai, open fire pits and in conventional ovens as a serving tray once the dish is done. It is available in a regular as well as a non-fat pan health option. The pans are available in a smaller portable size (390mm x 320mm), as well as a larger family size (570mm x 420mm). The pans are made from the highest grade of stainless steel and are perfect for outdoor use and indoor and camping situations."

"This led to our designers thinking of other products to develop. Next was the Bully Bar as we call it. This is a heavy duty washing line, hanger and storage bar. It is also suitable for hanging heavy household laundry such as duvets, curtains, carpets and blankets. It has a maximum weight capacity of 250kg and is suitable for outdoor use and coastal applications. This product is exclusively available via the Makro online portal."

"We now have 15 products in our range and they include wall hangers, assorted hooks, including universal and door



In February 2018 National Stainless Steel Centre will take delivery of a Timesavers machine and will be able to offer precision grinding and deburring of flat sheet components

hooks, house numbers, trivets and coasters, all made from stainless steel."

"The homeware division is diversification for the company and is volume driven but it is starting to keep the machines busy with daily development and improvement and additions to our product range, even though we have only been in the market for a year."

"Speed, accuracy, quality with maximum uptime, with repeatable results that are economic for us as a processor and for our clients, is what we are all about. Literally we like to be at the cutting edge of technology," concluded Mischel.

For further details contact National Stainless Steel Centre on TEL: 011 552 8800 or visit www.nssc.co.za ■



National Stainless Steel Centre have recently started manufacturing and marketing a range of household retail products in stainless steel. The Fire Fryer is an all-in-one pan that can be used on the grill, braai, 3 and 4 gas burner braai, open fire pits and in conventional ovens



Another retail product — the Bully Bar is a heavy duty washing line, hanger and storage bar

More than a metal fabricator manufacturing equipment for the catering, hospitality, food services and bakery industries

When Grant Norton purchased a shareholding in his father's business in 2010 he was not quite ready to join the business full time. Together with his uncle Jeff Norton they purchased a majority stake in Metnor Manufacturing from dad Greg when it was focused on manufacturing high volume, low mix products that were mainly used in the bakery industry.

"The business was established in June 1993 to manufacture and supply small-bore tubular components for the motor industry and was registered as Normet Auto Tube. However, a year later the business diversified into the manufacture of steel bakery racks and mobile trolleys and complementary steel products for the food and bakery industries. That same year the company changed its name to Metnor Manufacturing to reflect the change in the company's product mix that it would manufacture and the market it would service in the future."

"For the next few years the company established itself as a major manufacturer and supplier of racks for the food industry on a national basis. Greg built up a relationship with Livanos Brothers Bakery Equipment Suppliers, which led to him getting other products to manufacture. These include trolleys and other material handling equipment. Anything that needed racks and needed to be easily moved on wheels, whether it was going into an industrial or supermarket oven, Metnor would manufacture."

"At the time there was huge growth in the in-store bakery industry and consequently Metnor's fortunes. Expansion led to a couple of manufacturing facility moves as well as



Grant Norton, MD of Metnor Manufacturing with Design and Development Manager Muhammed Uwaiz Khan

diversification into supplying trolleys, buggies and other material handling equipment for the textile and fishing industries."

"As we all know the Western Cape was a very strong and a dominant supplier in these industries until the Chinese decided that South Africa was an appropriate export opportunity. The textile manufacturing industry, in particular, has been devastated with the advent of cheap imports."

"Nonetheless, Metnor continued to prosper and in 2000 was contracted by well-known bakery equipment supplier and one of the largest in South Africa – Macadams Baking Systems – to manufacture their entire range of bakery racks and trolleys. This agreement linked Metnor to markets on the African continent and other international destinations."

"At the same time the material mix was changed to include stainless steel and further increase the product range to include oven stands, sinks, tables and other products used in the food and bakery industries. The link to the international market increased exports as well as quality requirements from these clients. As a result the company was accredited with ISO 9001:2000 in 2003 and has retained this quality management certification ever since."

With the company chiefly focused on sheet metal manufacture, welding, fabrication and assembly, many components associated with the products were outsourced. Where possible these were now manufactured in house, to reduce costs and become more competitive and self-sufficient. At the same time the company diversified into manufacturing more material handling and storage products and not necessarily just relying on supplying the food and bakery industries."

"Over the next few years the company had its ups and downs with external and economic pressures influencing



Metnor Manufacturing was established when it focused on manufacturing high volume, low mix products that were mainly used in the bakery industry, such as mobile racks



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A recent installation at Metnor Manufacturing is the Amada HD 1303 NT press brake that features a Hybrid Drive System that is engineered for high-precision bending repeatability, low energy consumption, and less maintenance than a conventional hydraulic press brake, as well as being equipped with an auto-crowning feature. Additionally, the HD1303NT press brake has a sheet follower (SF1548H). This is capable of handling a sheet weight of up to 150 kilograms. It is used to minimise labour stress on bigger and heavier sheets being bent. One operator can handle large/heavy sheets as the sheet follower moves in conjunction with the bending motion of the machine and follows the sheet, supporting it throughout the bend process



The most recent addition to Metnor Manufacturing's machine shop is the Amada EMZ 3612 NT punching machine that is equipped with a tapping feature. It is only the second of this type of Amada machine that has been installed in South Africa and what appealed to the company was its ability to carry out form, bend and tap operations on the same machine

the profitability of the company. It did however, manage to increase its head count and from having 12 staff members in 2003, and this had reached 19 by 2011, just before I joined the company on a full time basis."

"After school I followed my passions by qualifying as a game ranger and then as a commercial diver before my wife Laura and I started a restaurant in 2006 in a heritage house situated in Somerset West, Western Cape called Henri's. Laura is a chef and between us we built it up into one of the leading restaurants in Somerset West before selling it in 2013."

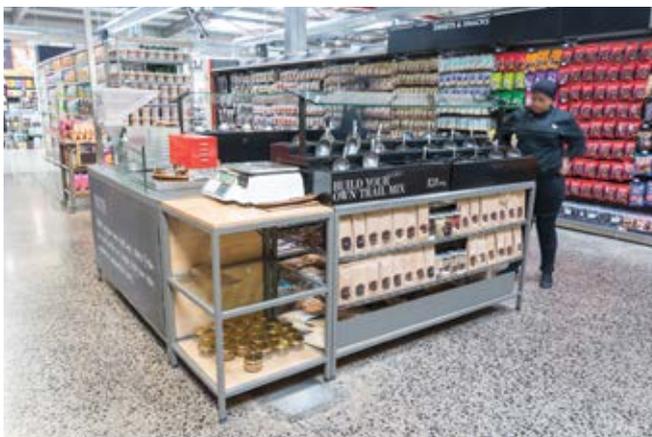
"I had in the meantime joined Metnor on a full time basis in 2012 when Dad went on retirement. Besides my uncle, who is generally a sleeping partner, there is also a third partner, Willie Pieters, who had joined the company in 2007.

So when we took over as the new owners we had continuity in management."

The new era

"When the company was established in 1993 it worked from a 200m² facility in Stikland before moving to the Blackheath industrial area in 1997. Initially we occupied 400m² of space but this soon grew by another 800m². In 2013 the company purchased its own 2 000m² factory and manufacturing facility, also in Blackheath, which is not far from Somerset West. Then in 2014 we increased our space to 3 000m² under roof and we have now increased this to 3500 m²."

"We have more than doubled the space that the company occupies since I joined. This growth in space is synonymous ▶



Metnor Manufacturing supplies equipment to Woolworths for its 'supermarket with a difference' concept



A Woolworths 'freshly squeezed' station in the produce market used for freshly squeezed-on-the-spot juices and smoothies

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Metnor Manufacturing now specialises in the design, manufacture and supply of refrigeration, as well as heating and structural equipment for the catering, hospitality, food services and bakery industries



A mobile cabinet being assembled

with how the company has grown and what services and products Metnor now offers and manufactures. This is also commensurate with the amount of staff that we now employ, which has reached a total of 56.”

“It is not that we have reinvented ourselves or changed our industries that we cater for. Instead we have increased our visibility and service solutions that we offer these industries and others. We now specialise in the design, manufacture and supply of refrigeration, as well as heating and structural equipment for the catering, hospitality, food services and bakery industries.”

“My seven years running the restaurant gave me good insight into what restaurateurs experience in equipment, layout and other challenges required to run a successful business. Generally you will have a chef running a business that relies entirely on their expertise in cooking to make a success of the business but generally has little knowledge on the other aspects of the business. There are many pitfalls. Besides staff and logistics being up there as the most challenging, the equipment and layout requirements can be an ‘obstacle’ to most of these entrepreneurs.”

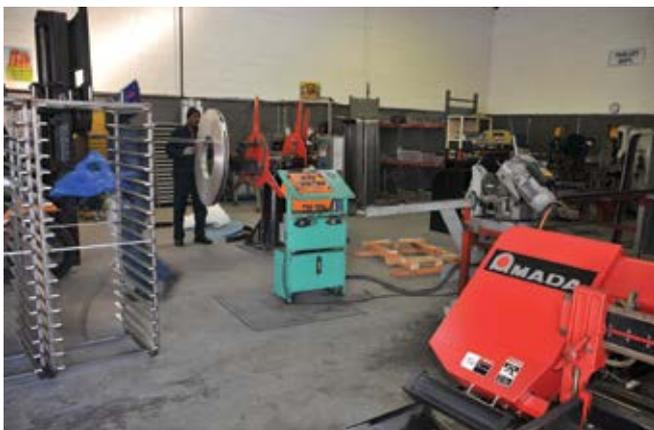
“For a brief period Metnor ventured into offering turnkey commercial kitchen installations, but our strengths lay in manufacturing and this is what we have gone back to, while still offering all these services, such as design, layout, service drawings, we have shifted our focus away from the end customer and now supply mainly to the dealer market.”

Woolworths connection

“This concept to change the company to a solutions business coincided with the fact that Dad had built up a relationship with Woolworths during his 19 years at Metnor, the food and clothing retail chain that is well-known to most South Africans.”

“At the time Woolworths had begun a strategy to grow a footprint through its ‘supermarket with a difference’ concept. These included a much bigger fresh produce area, surrounded by an abundance of fresh fruit and vegetables, interactive areas including a ‘coffee bar’ in the coffee aisle, where customers can taste some estate and regional coffees, with the option of having beans ground to their specification, a ‘freshly squeezed’ station in the produce market for freshly squeezed-on-the-spot juices and smoothies as well as an olive oil and balsamic vinegar tasting station for sampling local and imported oils and vinegars, appealing butcheries and cheese counters and other food and drink related tasting stations.”

“All of these need equipment that is not only functional but also aesthetically pleasing. It was certainly a concept that we were prepared to be part of. Besides supplying them with their stainless steel structural requirements, we also supply them with their bespoke shop fitting /display solutions such as the coffee cart and coffee roasting pod, as well as their biltong display and lately their newly launched chocolate pod amongst others. This has facilitated the need for acquiring new skills in the manufacture of shop fitting equipment with the use of glass, wood, marble and other materials beside steel.”



In total Metnor Manufacturing has three Amada press brakes



Other equipment includes four eccentric presses (up to 30 tons), semi-automatic tube benders, guillotines and Amada bandsaws



Another food industry cabinet manufactured in stainless steel being assembled



The focus of the company is on the machine shop, which supplies Metnor Manufacturing as well as other companies with punched, formed and bent components and sub-assemblies

Divisions

“With manufacturing and fabrication being the main function of the company, we now have four main divisions. Our first division, the machine shop supplies our own factory as well as other companies with punched, formed and bent sub-assemblies. Secondly, our refrigeration division specialises in the manufacture of under counter refrigerators, as well as other custom refrigeration solutions. This division also installs cooler and freezer rooms. Thirdly, our general fabrication section manufactures all the structural equipment

from tables to sinks to mobile coffee carts and chef demo units. Last but not least is our gas and electrical department that specialises in the manufacture of commercial gas and electrical equipment for the hospitality industry. This department has recently received their accreditation from the LPG association of South Africa as an authorised manufacturer of gas appliances.”

Metnor’s design office boasts the latest software packages from Dassault Systems, Autodesk and Amada. In the design office they can simulate assembly of products,

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All this growth and product development in a company is only done if the company invests in its equipment, services and people. Norton confirms that they have applied for and been allocated grants from the dti to grow their business and output. The company has taken advantage of these grants that have been available for capital equipment expenditure

from cutting, punching, bending, assembly and welding. This simulation allows them to design around any problems that may occur during actual production and help streamline steps through CNC cutting, bending, punching and welding machines where possible.

Training

Additionally, Design and Development Manager Muhammed Uwaiz Khan believes in creating a training atmosphere in the work environment. This is why Metnor runs various student programmes in accordance with universities, training colleges and Merseta requirements. Metnor’s management together with their resident mechanical engineers are dedicated to addressing the ever-widening skills gap that the manufacturing industry experiences.

Having popular software programmes like Solidworks, Revit, AutoCAD, Sheetworks and various other CNC programmable software ensures that Metnor is continuously at the forefront of design within its industry.

With the latest in solid modelling software, Metnor is able to take a customer’s design /layout/sketch and produce photo realistic renderings. The Solidworks software allows them to design, test and prefix parts together to ensure the correct manufacturing techniques can be used to develop the product.

This software also aids in the fault finding in a particular design, and allows the design team to correct these errors before it gets produced. Sheetworks 2017 takes an entire Solidworks model, and converts it into a programming model from which the factory machines can be programmed.

New equipment

All this growth and product development in a company is only done if the company invests in its equipment, services and people. Norton confirms that they have applied for and been allocated grants from the dti to grow their business and output. The company has taken advantage of these grants that have been available for capital equipment expenditure.

“It is not an easy procedure but once through all the paperwork and bureaucratic demands it is worth it. It is advisable to use a consultant or relevant company though, to help you through the process.”

“From old but serviceable equipment we now have two of the latest Amada punching presses and three of the latest Amada press brakes, two Amada automated band saws, as well as an Amada TOGU III automatic tool grinding machine.”

“The most recent addition is the Amada EMZ 3612 NT punching machine that is equipped with a tapping feature. It is only the second of this type of Amada machine that has been installed in South Africa. What appealed to us is that it has form, bend and tap operations.”

“This generation of Amada’s electric servo driven punching technology, accompanied with a high level of automation, allows for the full production schedule rather than just the processing of sheet metal.”

“Another recent installation is the Amada HD 1303 NT press brake that features a Hybrid Drive System that is engineered for high-precision bending repeatability, low energy consumption, and less maintenance than



Metnor Manufacturing showed its versatility to adapt by supplying Darling Brewery with equipment



One of the two Amada punching presses that Metnor Manufacturing uses

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Metnor Manufacturing will supply complete units according to a client's requirements, even if they are not entirely made out of metal

a conventional hydraulic press brake, as well as being equipped with an auto-crowning feature.”

“Additionally, the HD1303NT press brake has a sheet follower (SF1548H). This is capable of handling a sheet weight of up to 150 kilograms. It is used to minimise labour stress on bigger and heavier sheets being bent. One operator can handle large/heavy sheets as the sheet follower moves in conjunction with the bending motion of the machine and follows the sheet, supporting it throughout the bend process.”

“We still have our older bending machines that are used for specific components but when you are processing between 30 and 60 tons of thin gauge material, depending on what projects or products we are involved in, you need to have the latest equipment at your disposal. We can process stainless steel and mild steel up to 3.2mm thickness.”

“Other equipment includes four eccentric presses (up to 30 tons), semi-automatic tube benders, guillotines, and a decoiler/leveller used for automatic levelling, deburring and punching operations and of course TIG and MIG welding.”

Custom built cooler units and display fridges

“This is a relatively new development

in the company but one that fits our profile and the type of businesses run by our clients. We now manufacture display fridges or deli counters, or any application where good looks as well as high performance and hygiene are required.”

“In May 2016 we purchased a local refrigeration company Cabimerical that was owned by Jean Deville and was manufacturing under bar refrigeration products. Jean, with over 25 years experience in this field, has joined our management team and extended the range of refrigeration products that we offer to include custom built cooler units and display fridges, cooler rooms and freezer rooms, other refrigerated cabinets and ice bins.”

Interesting projects

“Our products are now operating over a wide area in South Africa and we have a dealer network ensuring we get known while we concentrate on the manufacturing component. The result is that we have been involved in installing equipment at a number of interesting locations.”

“These include De Brasserie restaurant in the Strand, Babylonstoren, Mooiberg Farm, which is situated between Stellenbosch and Somerset West, Lourensford Wine Estate, Spar Supermarket outlets, KFC, Weltevreden wine farm, Darling Brewery, Food Lover’s Market, The Harbour House Group, and of course Henri’s restaurant, to name a few.”

“Our relationship with Woolworths includes carrying out pilot work for them. They have launched a new concept aptly named NOW NOW and are testing it out in three locations in Cape Town. Metnor was involved from the initial concept and assisted with design, layout, service drawings, manufacture and installation. At NOW NOW you can order and pay using their app (available free on IOS and Android), so that by the time you reach the counter you can simply grab-and-go. Yup, you order and pay beforehand so that you only have to pick up at the shop – no need to queue.”

“Food and beverage outlets are increasingly becoming more sophisticated and we have to adapt to their needs. From design to finished outlet.”

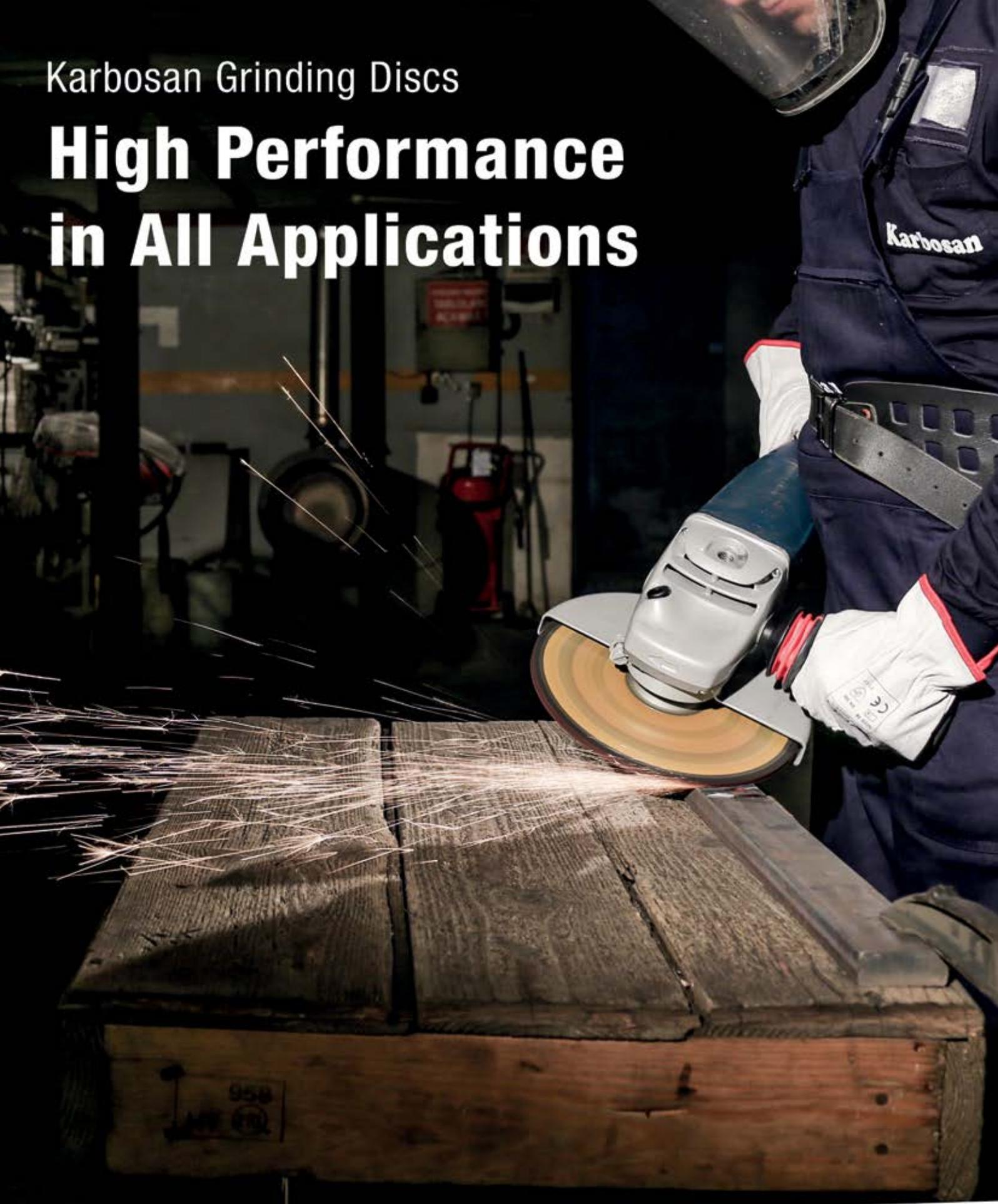
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Metnor Manufacturing uses a decoiler/leveller for automatic levelling, deburring

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Machine shop vital to SA Metal Group operations

Besides being a recycler and processor of metal, SA Metal Group maximises the value of scrap metal it collects by beneficiating steel, copper and brass.

SA Metal Group might be one of the oldest and largest scrap metal collectors and recyclers in South Africa but when you visit the company's head office in Epping Industria, Western Cape, you are introduced to an aspect of the company that is not commonly known – the beneficiating of the scrap metal that it collects and processes.

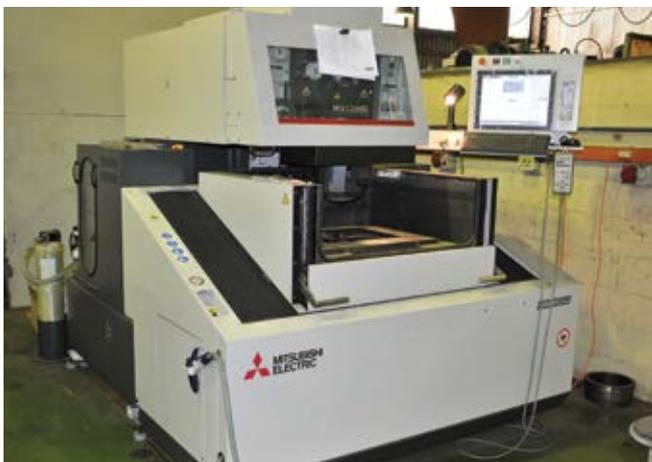
Scrap metal has been the core business of the family-owned SA Metal Group for the majority of its lifespan since grandfather Wolfe Barnett, an immigrant from the UK, established the company in 1919. Initially the company earned its revenue from buying up old machinery and breaking it up for spares. Scrap was a byproduct that was shipped back to the UK but this changed when spares became readily available in South Africa.

The Group is now run by Graham Barnett who deals with administrative functions, and his brother Clifford who looks after the operational side. Both started at the company in the 1980s while their father Aubrey was in charge. More recently fourth generation Barnetts – Graham's sons Daniel and Rafael have joined the Group.



SA Metal purchased their first Leadwell CNC machine in 2013 and now have four Leadwell CNC machines

Our appointment was to find out more about the machine shop of the company, which to my surprise had been part of the company since it was set up in 2000. Machine Shop Manager Grant Kensley, who has been with the company since 2005 and is one of the driving forces in equipping his domain with the ▶



SA Metal have recently added a Mitsubishi MVI200S Wire EDM to their machine capabilities because of the scope of the work that is now required by the Group divisions



Final machining of rollers, which includes various grooving and notching operations, is done on a Leadwell LTC 50 XXLM CNC lathe that SA Metal specifically purchased in 2014

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Machines are set up so that unattended machining can take place

The latest CNC machine tool that SA Metal have invested in, which was installed in 2016, is a Leadwell MCV-1500i vertical machining center. The 5-axis machine has XYZ travels of 1 520 x 760 x 720mm and a table size of 1 550 x 750mm

latest CNC machines, met us at the front entrance of the head office of SA Metal Group, which is situated in Christian Avenue, Epping Industria, Western Cape.

As large trucks laden with scrap metal rushed by and you dodged the empty ones leaving the scrap yard we were not prepared for what we were about to witness over the next three hours. They always say first impressions are the lasting ones but sometimes this is not always true.

After passing through tight security — scrap metal collection and recycling is big business — Grant escorted us to the machine shop area. The facility had been set up when SA Metal commissioned its melt shop in 2000. Equipped only with two conventional lathes, a mill and a drill the machine shop's primary focus then, as it still is today, was to manufacture spares and wear parts for the melt shop and any other component that was needed for equipment used in other areas of the company.

The machine shop has now become an integral unit of the SA Metal Group and it not only services the equipment used in the scrap metal recycling and processing divisions that are

situated in Epping but also those around the rest of the country. Additionally, the SA Metal Group now has a rolling mill division that manufactures rebar — SA Steelworks — and has recently established SA Copperworks, which beneficiates copper and brass scrap into copper busbars and brass bar. These two divisions are serviced by the machine shop and SA Steelworks in particular, has grown significantly in its own right.

“We only purchased our first Leadwell CNC machine in 2013 and now have four, with more to come. We have also recently added a Mitsubishi Wire EDM because of the scope of the work that is now required by the Group divisions. As you can see it is a very busy machining facility and it still does not accommodate all the requirements of the Group. We still use outside entities to machine certain of our components.”

“You could say that the rebar rolling mill is our biggest ‘customer’ and was one of the reasons we had to purchase the CNC machines. The mill was only established in 2010 and is situated in Airport Industria, Cape Town. SA Steelworks manufactures steel billet, reinforcing bar and round bar in straight lengths and coils.



Rollers that have been supplied rough machined



The machine shop at SA Metal manufactures many different spares and wear parts, such as bearing housings (choc blocks) and other types of housings, flanges and spacer rings, for other divisions in the Group

All products are manufactured from 100% recycled scrap steel, thus contributing to preserving the environment.”

“Our shredded steel scrap is melted using energy-saving and low-emission electric induction furnaces and is then refined, alloyed and continuously cast into billets. These are then reheated and rolled into a range of long steel products, all manufactured in accordance with international and South African Bureau of Standards (SABS) specifications. All recycled steel used at SA Steelworks is collected in the Western Cape and processed in our own works.”

“In a mill the attrition of components and wear and tear of the rollers used to manufacture the six different sizes of rebar that the company manufactures, is high. Depending on the size and the use, lifespans can be different between the rollers. SARCO supplies us the rollers rough machined and then we perform the final machining, which includes various grooving and notching operations on the Leadwell LTC 50 XXL CNC lathe that we specifically purchased in 2014. The machine can accommodate workpieces up to three tons with turning lengths up to 3 910mm and was installed by WD Hearn Machine Tools.”

“This machine is very integral to our roller manufacture and refurbishment. One roller could require between 10 and 18 grooves with 120 notches per groove. Initially we had a bottleneck when we had to do the notching operation but we have worked out an indexing system and now we can have unattended machining. This has reduced the machining time per roller down to no more than 13 hours whereas previously it would take double that amount of time.”

“Rollers also require a number of other components to be fitted before being installed in the line at the mill. These include bearing housings (choc blocks) and other types of housings, flanges, spacer rings, and guide rollers. All these components are now manufactured on our other CNC machines whereas previously they were contracted out.”

“There are several advantages of having in house machining. These include cost, turnaround time and more importantly, if we need a change to the design of the grooves on the rollers it can be done without any external pressures. Rolling and rebar finishing in the mill is pretty standard but these days the requests for varied designs of rebar with shorter runs are more frequent so you have to adapt accordingly. We have the necessary software programmes such as SolidWorks, Autodesk Light and Edgecam so we can change our designs and machining operations to suit our needs.”

“However, it is not our intention to compete with outside machining shops. Where we do not have the capability we still contract out. The progression and advancement of the machine shop has been through necessity. With our constantly evolving experience we are now able to machine a number of critical components and we like to keep this intellectual property to ourselves. The SA Metal Group employs 120 staff in the engineering division, which the machine shop falls under, and that includes 10 qualified engineers. Including myself there are 13 staff in the machine shop and we are kept very busy with requests from the other areas of the Group.”

“A scrap metal recycler and processor such as SA Metal Group has a large amount of equipment that is used in the management of waste. The material handling equipment and attachments include balers, shredders, shears and cranes. The Group has over 100 cranes deployed at the main and satellite sites and, because of the harsh environment that



The machine shop management team: Dennis Koopman, Clifford Barnett and Grant Kensley

the equipment works in, there are constant breakdowns and requests for wear parts to be replaced. Although the machine shop does not take care of all requests we are increasing the amount of components that we manufacture. Through the engineering department we use reverse engineering for drawings and in the case of one of our shredders we purchased the IP for the machine and can now manufacture the full range of wear parts for it.”

“The latest CNC machine tool that we have invested in, which was installed in 2016, is a Leadwell MCV-1500i vertical machining center. The 5-axis machine has XYZ travels of 1 520 x 760 x 720mm and a table size of 1 550 x 750mm. Again we have set it up so that we can have unattended machining. We purchased this machine because milling operations became a factor in the componentry that we are now required to machine.”

“The other machine that we purchased last year was our Mitsubishi MV1200S wire EDM machine, also supplied and installed by WD Hearn Machine Tools. With the introduction of our two beneficiating plants – SA Steelworks and SA Copperworks – we now have a call for manufacturing our own tooling. The Mitsubishi takes care of the production of this type of work.”

Beneficiating

“Scrap metal prices per kilogram in South Africa are consistently changing and it is always a challenge for those companies in the industry to keep up with the changes. Ultimately however, we have been around for many years and now have 10 locations around South Africa – we only expanded outside of the Western Cape in 2001.”

“We have always believed in adding value to whatever material we collect wherever this is viable. All scrap metal purchased by the Group is processed by sorting, shearing, shredding, torch-cutting, granulating and baling, amongst other processes. In addition, all our scrap processing yards are equipped with the latest cranes and handling equipment that are able to unload material from suppliers, safely and quickly.”

“Our steel shredding plant for example, situated in Christian Avenue, Epping Industria, produces shredded steel scrap at a rate of up to 120 tons per hour, reducing auto bodies, home appliances and other steel structures into fist-sized clean fragments of steel.”



Because of the constant fluctuation in the price of scrap metal SA Metal took the decision that wherever possible they should add further value to the metals that they were processing

Great care has to be taken during a copper melt. Copper won't melt until it reaches 1 084 degrees Celsius

“But it is not only steel that we recycle and process. All non-ferrous metals are processed or sorted in our main and satellite sites. This includes aluminium, copper, zinc, stainless steel, lead, nickel, brass, tin, bronze and others. We purchase scrap metal from a wide range of Southern African sources including industrial enterprises, scrap metal dealers and private individuals.”

“Non-ferrous metal and shredder waste recovered from the shredding plant is sorted further in our separation plant, where a combination of perforated screens, wind sifters, eddy-current separators and induction sorting systems (ISS), coupled with hand-picking lines, ensure that over 99% of the metal contained is safely and efficiently collected.”

“Designed for high capacity and reliability, our two 1 000 ton Lindemann shears, the largest in Africa, are situated at Epping Industria and at our plant in Germiston. A third 1 000 ton Le Fort shear is operational in Pretoria.”

“The company is geared to operate in remote regions where mobility is paramount. With this in mind, our mobile baling machines are rigidly constructed to ensure optimal productivity. By compacting vehicles and other light metal raw materials into manageable-sized bales, we are able to facilitate the cost-effective transportation of this material to our works. Our mobile shears are likewise used in much of our demolition work and in the processing of on-site scrap material. Designed with durability and structural integrity in mind, mobile shears can ▶



Left: Copper is a ‘soft’ material and can easily be extruded



Middle: Brass rods that have been extruded



SA Copperworks, a division of the SA Metal Group, now manufactures a wide range of high-conductivity rectangular, square and round copper busbars, coiled copper rods and strip, paper-covered copper strip for the transformer industry, round and hexagonal solid and hollow brass bars, and solid square brass bars, as well as other profiles on request



Bystronic

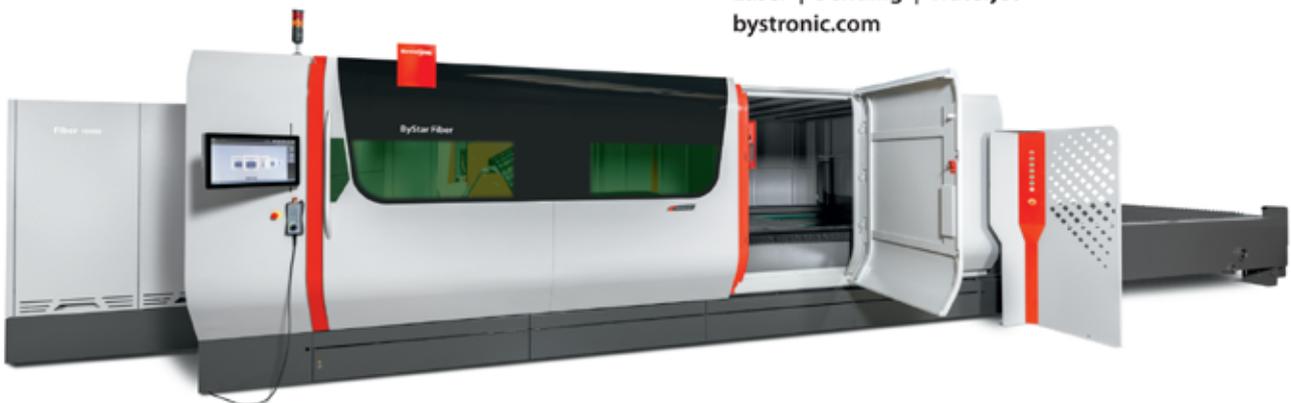
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operate in the harshest of conditions and, with unparalleled power, allow a fast cut cycle that dramatically increases efficiency.”

“Advanced portable spectrometers are used extensively in our day-to-day operations. These provide accurate metal analyses to ensure the correct valuation of recyclable material.”

“Our weighbridges are electronic, assized and calibrated and are fitted with radiation detection equipment and cameras to ensure safety as well as accurate, documented systems for all material received at our yards across the country.”

“Our works is also equipped with a boiler-shop, container building and repair works, a hydraulic repair shop, a carpentry shop and plumbing and electrical departments.”

Further beneficiation of copper, brass and steel

“Because of the constant fluctuation in the price of scrap metal we took the decision that wherever possible we should add further value to the metals that we were processing. This resulted in the establishment of a steelworks mill in 1999.”

“Under the banner SA Steelworks, SA Metal Group manufactures steel billet, reinforcing bar, round and square bar in straight lengths and coils at this plant. All products are manufactured from 100% recycled scrap steel.”

“Our shredded steel scrap is melted using energy-saving and low-emission electric induction furnaces and is then refined, alloyed and continuously cast into billets. These are then reheated and rolled into a range of long steel products, all manufactured in accordance with international and South African Bureau of Standards (SABS) specifications. SA Steelworks is the only operating steel mill in the Western Cape region.”

Raw materials

The production of copper products begins with raw material in the form of either copper scrap, newly refined copper (called cathode copper, or simply cathode) or copper ingots. The choice of raw material depends on economic factors such as cost and availability, and the technical capabilities of the plant’s melting furnace.

Copper scrap is most often in the form of recycled copper wire that has been stripped of its insulation and/or baled copper tube, pipe, rod and other scrap that has been removed from demolished buildings, for example. Another common



Copper busbar that has been extruded by SA Metal



Solid copper bar manufactured by SA Metal

form of scrap is the so-called “home” or “runaround” scrap generated within the processor or fabricator itself.

“We realised that the company was collecting enough copper and brass scrap to consider beneficiating the material further. Coupled with the success and experience that the company had gained with setting up SA Steelworks and our own research, a decision was taken to setup a facility to manufacture copper busbars and brass bar with the intent to supply a broad spectrum of fabricators.”

“There are many fabricators of copper busbar in South Africa but very few companies that are manufacturing the busbar itself. The decision was made in 2015 and the process of setting up the mill to produce the copper and brass rod began. The installation of equipment for the mill was completed in early 2016 and includes a 1 000kW Inductotherm VIP™ Power Supply Unit.”

“The continuous cast melting process allows us to produce solid copper rod which is then coiled before being sent to the extrusion facility, which was also setup from scratch.”

“SA Copperworks now manufactures a wide range of high-conductivity rectangular, square and round copper busbars, coiled copper rods and strip, paper-covered copper strip for the transformer industry, round and hexagonal solid and hollow brass bars, and solid square brass bars, as well as other profiles on request.”

“Product is either cut-to-size or coiled in strip, depending on the application needed by the fabricator. A full range of sizes are manufactured.”

“All the dies and other necessary accessories for these facilities are manufactured in our machine shop, as are any wear parts for the continuous casting and extrusion machines.”

“We have invested heavily over recent years and we can now boast that we have one of the largest capacities in South Africa to manufacture copper busbar that is supplied to many different industries.”

“Most scrap yards typically accept recyclable material from contractors and others, but many of them act only as the middleman and resell the material to specialised processors outfitted with the necessary high-tech equipment to efficiently process the material. We are now very much one of those specialised processors.”

For further details contact SA Metal Group on TEL: 021 590 3900 or visit www.sametal.co.za



Other profiles and sizes are manufactured on request

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Five reasons a 5-axis CNC machine is actually good for your shop

Savings in set-up and production times and cost, will speed up the return on investment.

Megan Ray Nichols

The 5-axis CNC machine tool is a mainstay on many manufacturing plants and shop floors. While these systems once were reserved for undertaking complicated and specialized applications, large and small manufacturers now realise the value in using a 5-axis machine for every project. Many of them have been able to minimise lead times, bolster efficiency, and improve profitability as a result. These are some of the factors guiding their decisions.

1. Save time — One of the most obvious advantages of a 5-axis CNC mill is the reduction in time it takes to complete a project. Whereas a standard 3-axis machine might require several different set-ups and more than five hours to complete, its 5-axis counterpart can complete the part in just a couple operations that take less than two hours from start to finish.

There are two types of 5-axis machining: 5-sided, sometimes called 3+2 machining, and simultaneous 5-axis. Both methods are faster than traditional 3-axis machining, but 5-sided machining is much quicker and easier to program. Simultaneous 5-axis machining ultimately results in a smoother surface finish, according to experts, which is typically required to compete for projects with many aerospace applications.

2. Reduce cost per part — You can also reduce the overall production cost per part by using 5-axis machining. Because traditional 3-axis machines are able to work only on one side of a part at a time, those parts that require multiple finished sides require recalibration and, in some cases, reprogramming. All of this increases overall production time and labor, which all ties into the final product costs.

3. Improve moulding — Moulds made from liquid silicone rubber (LSR) or similar substances, are becoming increasingly complex. This is a result of design developments in some industries, such as the medical device manufacturing, that call for increased versatility in their new products. To accommodate this, many manufacturers are making the transition to 5-axis machines. Mould producers of nearly every specialisation now realise the value in using advanced equipment for their needs.

While 3-axis machines will suffice for milling simple moulds,



these units might not even be able to handle some of the more complex designs seen in products today. They're simply not accurate or fast enough to meet the evolving and stringent industry standards. Projects like this specifically call for the use of a modern 5-axis mill.

4. Compatible with CAD/CAM — The technologies behind computer-aided design and computer-aided manufacturing have advanced by leaps and bounds over the past decade or two. Whereas once there had been limited software support available for 5-axis machines, nearly all of the most popular CAM software developers have upgraded their products to accommodate the additional two axes. There are excellent examples of how software programmers are implementing support for 5-axis mills.

5. Suitable for general and special projects — Some manufacturers and machine shops operate under the

impression that 5-axis machines are solely for special projects or highly complicated parts. While they can make short work of complex pieces, it's not their only application. Like their more traditional CNC machines, 5-axis mills also excel at simple parts and pieces that require minimal work.

Due to the high speed and efficiency of the newer hardware, manufacturers from all over the world are upgrading their traditional, 3-axis machines with 5-axis replacements. Best of all, they're already experiencing shorter lead times, greater quality control and greater profitability across the board.

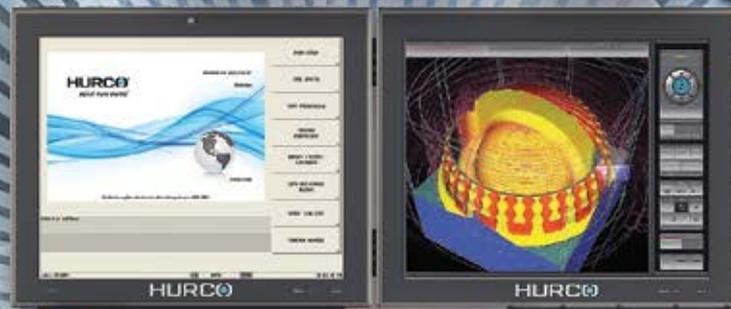
Although they remain costly in terms of capital investment, 5-axis machine tools offer the opportunity to save a lot of set-up and production time and cost that will speed the return on investments, so that the transition to a 5-axis machine can be completed as soon as possible. It's not a process that needs to happen overnight; There's still some time left to get an edge over your competitors. For manufacturer or machine shop that wants to optimise production times and maximise profits, the upgrade should be made sooner rather than later.

Megan Ray Nichols is an amateur astronomer and environmentalist, and a writer on a variety of scientific topics. ■

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EMO Hannover 2017

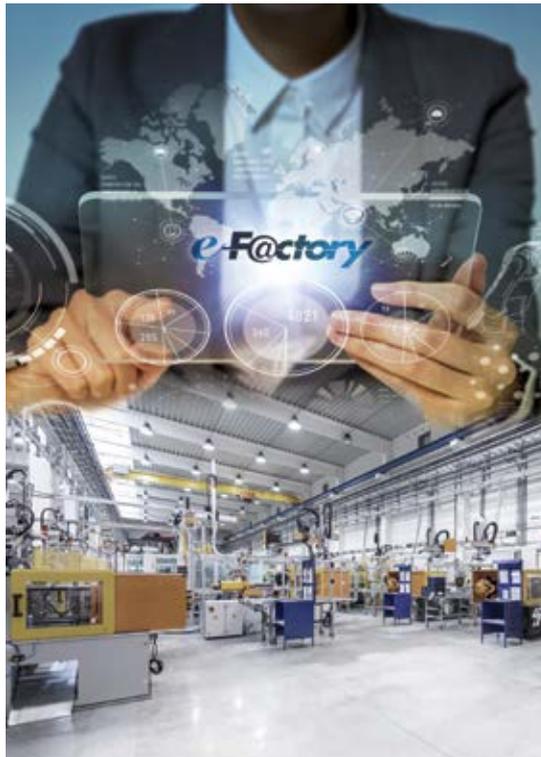
theme of “Connecting Systems for Intelligent Production” allowed exhibitors to showcase their smart solutions

The EMO Hannover 2017 theme of “Connecting Systems for Intelligent Production” lived up to expectations from the many exhibitors who were only too willing to show you how they have embraced the concept by implementing Industry 4.0 or the Internet of Things (IoT) in their products or future plans.

Many were demonstrating connectivity solutions, data analysis applications and other innovative services, each trying to outdo the other with their novel idea giving a reflection of how they have interpreted the theme and the concept. However, throughout the exhibition the emphasis was on systems capable of inter-connecting multiple partners, cloud-based machine monitoring solutions, simulation software, augmented reality for machine maintenance, block chain technology for secure data transfer, new business models and much more.

Prior to the show beginning, EMO’s organisers said they were confident that the show would generate impetus for implementing Industry 4.0 or the Internet of Things (IoT) concepts.

“In the machine tool sector we have long since implemented digitalisation,” explains EMO’s General



Commissioner and VDMA President, Carl Martin Welcker.

“Digital images, for example, for simulations have likewise been possible for quite a long time now. Under the keyword of Industry 4.0, the task now is to network the entire production operation, and indeed the complete added-value chain.”

He also refers to Industry 4.0 as a mindset: encouraging staff to come up with ideas on how they can put Industry 4.0 into shop-floor practice.

“In a consistently networked manufacturing line, flexible production is possible with optimised sequences, so that even rush orders in small batch sizes can be handled. Complete networking of the entire production line with real-time communication and control will create maximised added value for companies when it implements horizontal communication from receipt of the order all the way through to dispatch. Within the

added-value chain, moreover, it’s important to network not only the component suppliers, but also the logistical partners and the customers involved, so as to achieve maximised productivity, flexibility and efficiency. If all this succeeds, this signifies a quantum leap forwards in terms of productivity, ▶



and will catapult those who can do it to the leading edge of international competition," is the succinct verdict of Carl Martin Welcker.

Individual responses

At EMO, control developers and manufacturers, software companies, tooling companies and machine tool builders demonstrated their individual responses to Industry 4.0 requirements.

"The keynote theme of this year's EMO Hannover gave us the ideal backdrop against which to present market-ready products for digital manufacturing," said Christian Thönes, chairman of the executive board of DMG Mori AG, Bielefeld, Germany.

ADAMOS

"Through the joint venture ADAMOS (ADaptive Manufacturing Open Solutions), DMG MORI, Dürr, Software AG and ZEISS as well as ASM PT have established a strategic alliance for the future topics of Industry 4.0 and the Industrial Internet of Things (IIoT). Germany's first alliance of well-known industrial and software companies wants to establish ADAMOS as a global standard for the industry and attract other machine builders to become partners," explained Thönes.



"Regarding digitisation the machine and plant building industry has to set its own standards and drive development. This can only work with strong partners. That is why we are offering an open network with ADAMOS together with leading machine building, production and software/IT know-how – from machine builders for machine builders, their suppliers and customers."

"Thanks to revolutionary input devices, the machine operator will perceive a new level in terms of user prompting and control

capabilities," says Markus Frank, Department Head Grob-Net4Industry.

"The innovative Grob4Pilot product has been jointly developed in conjunction with application technicians, operators, designers and software engineers. The motto adopted for the development work was usability meets efficiency."

"The thrust for Industry 4.0 will prove to be a dead end without the data from the manufacturing aids," comments Dr.-Ing. Götz Marczinski, Managing Director of Cimsources GmbH from Aachen.

"The ability to supply these data and to make proper use of them will in future be essential if you wish to remain competitive." ▶

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Bernd Zapf, Head of Development New Business & Technologies, explains the approach involved: “Under the aegis of Heller4Industry, we synergise all activities in connection with Industry 4.0 and digitalisation in the process chain. One of our goals in the field of metalworking is to increase productivity still further and thus create added value for customers. Upgrading overall equipment effectiveness (OEE) – which we see as the product of the availability, productivity and quality variables – will succeed when the machine is harmonised with the boundary conditions involved.”

Okuma introduced Connect Plan, the comprehensive smart factory solution. The application enables advanced factory visualisation, data processing and analysis as well as predictive maintenance, in an effort to facilitate smart manufacturing.

Okuma’s smart factory solution Connect Plan was created to maximise the potential of production facilities by increasing productivity and flexibility throughout the entire planning and manufacturing process. This solution stems from the know-how gained from Okuma’s own highly-automated smart factories, Dream Site and Dream Site 2, at the company’s Oguchi headquarters in Japan.

“In tune with the anticipated future requirements of Industry 4.0, the abundance of processable data available with these new Wire EDM machines that we have launched will ensure transparency throughout the production stages. Intel Security is pre-integrated to provide security,” said Product Manager Stephan Barg of Mitsubishi Electric.

“The Walter AppCom app gathers large volumes of machine, tool and process data,” said Florian Böppe, manager of the digital manufacturing department at Walter.

“No-one needs to stand next to the machine recording data anymore. Instead, users can view precisely the information they need on the Walter AppCom app,” said Böppe.

Sandvik Machining Solutions and TDM Systems offered an innovative solution that takes Tool Lifecycle Management to the next level, the company said. TDM Cloud Line includes easy set-up of Tool Database, provisioning of correct CAM data, manufacturer-independent tool assembly, statistical evaluation, and cloud-based solutions available at any time in any location.

Yamazaki Mazak unveiled its latest Industry 4.0 solution. Centred on two core pillars, Smooth Technology and the Mazak iSMART Factory™ concept, the solution aims to improve productivity on the factory floor, and has been implemented into Mazak’s own facilities throughout the world.

“After mechanisation, electrification and automation we now have digitalisation. Machines and their components are digitally networked with one another and with their environment. The aim of this networking is to simplify and optimise processes and thus to maximise the value creation chain. In the digital factory, also called the Smart Factory, there will be no more unplanned machine downtimes and resources will be optimally used,” explains Christian Josi, project manager at Fritz Studer AG.

“A Smart Factory isn’t simply created overnight. It is necessary to focus on certain areas. Studer has integrated the OPC UA standard into its “StuderWIN” machine software. The machine can assume two roles here: OPC UA Client and Server. This enables Studer machines to be integrated simply and securely into the environment of the digital factory.”

Another focus is on unplanned machine downtimes. The United Grinding Group – of which Studer is part – tackles this topic methodically, as a group. The aim: The customer will receive a tool, which enables cost-optimised maintenance. In other words, the machine will only be stationary if this is

planned and calculated. The United Grinding Group adopts the «Predictive Maintenance» approach here.”

“Another project that is being tackled by the United Grinding Group is the ‘One Push Remote Solution’. This means that if an assembly or component fails, despite Predictive Maintenance, the problem can be rectified at the press of a button and the customer can be offered optimal support.”

“Solutions 4. future” was Mitutoyo’s take on the whole concept but they presented nothing concrete but rather presented new products that would fit into the concept on the measuring and quality side.

GF Machining Solutions’ eTracking and new Seal Slot Technology represent breakthroughs in die-sinking EDM manufacturing. As advanced digital manufacturing technologies, eTracking and Seal Slot Technology are further evidence of GF Machining Solutions’ Industry 4.0 vision of intelligent, high performing and fully predictive manufacturing.

“Manufacturers typically collect huge amounts of data during operations, but often find that getting the insight they need from this data is more challenging than it should be,” explains Benjamin Bickel, Product Manager for HxGN Smart Quality at Hexagon Manufacturing Intelligence.

“HxGN Smart Quality provides a solution for manufacturers to aggregate information and manage resources across one or many locations including supplier sites. It addresses common pain points such as: Ensuring operators are using the latest version of measurement routines; enabling managers to analyse data from several machines as a single dataset; and proving machine utilisation to justify equipment investments. Users at all levels of the business can benefit from the functionality of HxGN Smart Quality.”

“For us, digital transformation is the key to success. For this reason, Sandvik Coromant is advancing digitalisation and networking with new ideas and intelligent concepts. With the use of new materials, technologies and processes, we are working on the future of the manufacturing industry. In this way, we offer our customers sustainable products and solutions for their success in the digital world. Equally essential is a new way of thinking: Not through insular thinking, but by counting on networking and collaboration with our customers, partners and suppliers. We meet the challenges of digital change with openness and the willingness to constantly question and further optimise what has been achieved. Thus, we are able to anticipate customer needs and successfully shape the future with genuine innovations,” said Nadine Crauwels, President of Sandvik Coromant.

Sandvik Machining Solutions and TDM Systems offered an innovative solution that takes Tool Lifecycle Management to the next level, the company said. TDM Cloud Line includes easy set-up of Tool Database, provisioning of correct CAM data,



manufacturer-independent tool assembly, statistical evaluation, and cloud-based solutions available at any time in any location. TDM Cloud Line was first presented at EMO 2017. Pilot customers will test the software this autumn.

The key advantage of this cloud solution is that users can download and manage data

from thousands of tools without having to purchase them. The solution can test alternative tools during the product design process and select the optimum tool for the specific design. At present, users have only data from tool manufacturers available to them, which can vary both in quality and depth. Data from the TDM cloud is available anywhere and is ready for immediate usage in the virtual cutting process.

Initiative for Networked Production

The VDW (German Machine Tool Builders’ Association) pre- ▶

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sented its initiative for networked production for the first time at the EMO Hannover 2017. "The aim is to develop a standard for linking a huge range of disparate machinery control systems to a shared interface (a connector), and create the necessary software," said Dr. Heinz-Jürgen Prokop, chairman of the VDW on the occasion of the Association's press conference. A core team is involved in the first phase of the project with the companies DMG Mori, Emag, Grob, Heller, Liebherr-Verzahntechnik, United Grinding, Trumpf, and the VDW.

The VDW Executive Board decided on this project because there has not been a standardised and consistent solution so far. With the planned standard, data is to be read from different machines with different controllers of many generations and transported into infrastructural systems or the cloud in a standardised data format to analyse it and use it for optimising production tasks. "This is the basic requirement for the success of Industry 4.0, especially in medium-sized firms," said Prokop.

For the machinery manufacturers, too, this would be a significant easing of their workload, enabling them to shed tasks that although they urgently need to be completed are nonetheless outside a manufacturer's main task and entail high costs. Plus, this creates an open system that offers a needed degree of independence and flexibility.

"Unfortunately the most recent developments showcased here at the fair also showed that in the case of control systems, particularly, the trend toward proprietary eco-systems is still ongoing," said Prokop. "We intend to counteract this, and are therefore working to establish a development partnership with the control system manufacturers to render the VDW's planned specification usable on the broadest possible scale."

VDMA Forum

The VDMA presented a forum at EMO 2017 under the theme of "Innovative solutions for Industry 4.0." 30 short presentations of innovative ideas and



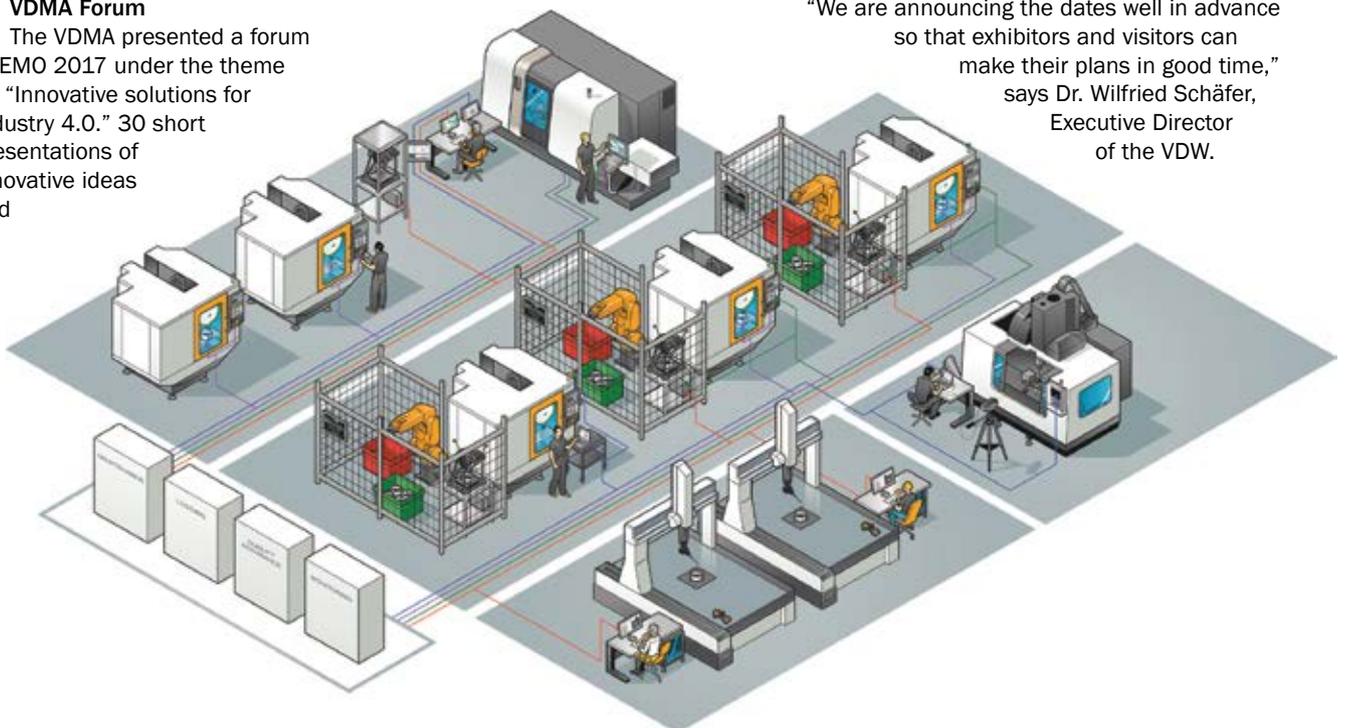
products relating to Industry 4.0 were given. The focus was on specific technical implementations from the fields of high-precision tools, metrological and testing equipment, research and exchange of tool data. Visitors also learnt how intelligent clamping systems work, and how by networking tools and software production processes can be simulated, tool lifecycles monitored, and costs downsized.

More than half of the show's approximate 130 000 attendees came from abroad, with 70% of foreign visitors originating from European countries. Attendance from Asia increased sharply. According to the EMO visitor survey, nearly 60% of the show's attendees were manager level. Along with digitisation and connectivity, additive manufacturing was reported to be high on the agenda for many EMO visitors.

Save the date — EMO 2019 — 16 to 21 September 2019

The dates have now been finalised for the EMO Hannover 2019. The VDW (German Machine Tool Builders' Association) in Frankfurt am Main, which is responsible for organising EMO Hannover, has announced that the next event will be held from 16 to 21 September 2019.

"We are announcing the dates well in advance so that exhibitors and visitors can make their plans in good time," says Dr. Wilfried Schäfer, Executive Director of the VDW.



► **Walter Bellora, BCF Precision Grinding**

“EMO 2017 was an eye opener for young and old alike and ranks as one of our best business trips that we have ever been engaged in. We cannot speak highly enough of our experience to the EMO machine Tool Exhibition in Hannover Germany.”

“From the moment we reached Hannover and met other South African visitors we all became one big family with the same goals – see, learn, return with knowledge and implement.”

“The opportunities are endless to make contact with fellow industrialists sharing ideas and problem solving in machining or manufacturing. Seeing the latest developments in our industry and to see in which direction our industry is moving in, what goals are set by world leaders in their specialised fields, was absolutely astonishing. As South Africans we are very much appreciated by overseas companies, they want to do business with us and we are not far behind technologically. In my personal opinion there is no lack of will in our industry and yet, there is this negativity in our industry, which is borne by the negativity of our government. There are no real incentives or back-up plans in South Africa as there are in foreign countries, with their governments backing and being fully behind the metalworking sector.”

“Small entrepreneurs have to go it alone here. We cannot always be expected to be competitive and to compete internationally with those countries that have the support from their governments, but our will to compete is still very strong.”



Wesley and Walter Bellora and Carlos ‘Miguel’ Goncalves de Almeida, all of BCF Precision Grinding

“As a first time visitor to the EMO machine exhibition we could not believe the sheer size of the exhibition. Words cannot do the exhibition any justice and the only regret that we have is not having gone there years before. If we may offer one piece of advice to anyone that is involved in the metalworking industry and in any position they might hold we would recommend that at least once in their lifetime they make the effort and visit the EMO exhibition.”

“We would like to thank Bruce for making our trip a memorable one, together with our South African friends that we shared our experiences with in Hannover.”

“As a first time visitor to the EMO machine exhibition we could not believe the sheer size of the exhibition. Words cannot do the exhibition any justice and the only regret that we have is not having gone there years before. If we may offer one piece of advice to anyone that is involved in the metalworking industry and in any position they might hold we would recommend that at least once in their lifetime they make the effort and visit the EMO exhibition.”

► **Aurelio Grech-Cumbo, RGC Engineering**

“The exhibition as usual was of an exceptional standard. What was evident was the increase in technology with regards to the digitalisation of information for manufacturing processes, automation, all with the aim of improving production efficiency. Information gathered via dimensional measurement and sensor technology in machine tools for process monitoring and analysis with the objective of maximising efficiency in manufacturing processes are all part of the new hype – Industry 4.0.”

“The one example was the Marposs Factory Net 4.0, which includes in-line statistical process control, total thermal vision for monitoring casting processes, the complete range of in-line and in process dimensional measuring systems and machines, non destructive, optical and leak testing systems.”

“Another example is Mitutoyo’s Measurelink Statistical Process Control System, which links all Mitutoyo measured data from measuring tools and measuring machines to local networks and an intranet.”

“GOM Optical Measuring Systems had equipment on display offering more than just measurement. They offer simple but precise and effective visual analysis of measured results for manufacturing process monitoring and analysis using the GOM Inspect Software. The company also had on display the GOM Scanbox Series of automated optical measuring systems for production inspection and process monitoring and analysis.”

“In the machining process areas there were interesting developments in additive manufacturing such as the MPA-technology developed by Hermle Maschinenbau GmbH.

This is a versatile tool for generative creation of large-volume components spread over a wide field of applications.”

“Hybrid components for the tool and mould-making industry can benefit tremendously from the Hermle MPA-technology. This is especially true in the field of injection moulding and die casting tools. One of its prominent features is the possibility to complement precast blanks with additively applied components. The results are hybrid-manufactured components entering new dimensions in additive manufacturing with weights up to several hundred kilograms and dimensions larger than 500mm in diameter.”

“Hermle also introduced the new performance line of 5-axis machining centers such as the C650 series.”



Aurelio and Miriam Grech-Cumbo, both of RGC Engineering



**Sean and Dean De Andrade,
both of Sylton Engineering**



**Tim Gilbert and Chris Riley,
both of Toolquip & Allied**



**Myles Crosthwaite of WD Hearn and
Brian Percival of Bell Equipment**



Peet Buitendag of EJE Industrial Electronics

► **Mike Lee, Puma Machine Tools**

“The Doosan stand had many new models launched at the EMO 2017 like the Lynx 2100SY horizontal lathe, the VTR1216M vertical lathe, the V8300M vertical lathe with tool changer and the DVF5000 5-axis machining center.”

“In my opinion Doosan is certainly now one of the main players in the machine tool industry. The machines exhibited and manufactured by them are of a high quality and with the vast array of models and technology available from Doosan, they can meet any needs and requirements customers may have.”

“Our other principals, Vision Wide and Chevalier, also exhibited interesting machines. All in all, a very successful exhibition.”



Mike Lee of Puma Machine Tools and Mario Botha of Retecon



**Ray and Graeme Cooper
of WD Hearn**



**Vaughn Hanwith Horden
of F&H Machine Tools**

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► **Eugene Hugo, JHPE Precision Engineering**

“EMO was a fantastic experience and I was amazed by the pure size and scale of it. The show is incredibly well organised and put together and daily travel was almost a treat it was so easy.”

“The exhibition really opened my eyes to what is available in the world and the massive size of the manufacturing sector. I realised how small our local market actually is, and saw a lot of brands that I have never heard of. It became evident that our industry and economy is very far behind compared to the big world out there, but we must see that as an opportunity for growth and use factors like our exchange rate to our advantage.”

“To anyone considering going to EMO I would say save up and do it. Planning is important. I would suggest writing down what items you want to look at and put extra focus on those if you see them because there is just too much to take in. Also, comfortable walking shoes are a must.”



Jan Hugo of JHPE Precision Engineering, Yahya Ceter of Guhring, Eugene Hugo of JHPE Precision Engineering and Sinan Arisoy of Guhring



Brad Wang, Marketing Director of CHMER with Anita and Sakkie Coetzee of Extreme Machine Technologies



Lars Grünhage and Daniela Siegel, both of WERKÖ GmbH, Charlie Lougassy, the President of TDC Cutting Tools Inc., Chloé Wang of WERKÖ GmbH, Peter Su and Singer Zhang, both of TDC Precision Tools Inc.



Christopher and Peter Killian of Hi Tech Machine Tools on the Mazak stand



Kroum Petkov of Fanuc South Africa and Frans Myburgh of Autocast



Bert Huang and DC Lio, both of Victor Taichung with Dudley and Alan Meredith of Victor Fortune South Africa



Jannie Krugel of CSI and Louis Struwig of Samsung South Africa

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► **Allan Connoly, Somta Tools**

"This year saw a quantum change for Somta Tools at EMO 2017. Whilst Somta Tools has exhibited on numerous occasions at EMO, this show reflected a quantum change in interest and potential due to the fact that this was the first time the company had exhibited as a member of the OSG group."

"In addition to the normal interaction with existing customers, the Somta booth was inundated with visits from OSG sales teams and their customers, from various countries. The exciting energy created an unprecedented 'buzz' on the Somta booth, which in turn attracted other visitors who normally would have walked by."

"OSG will be promoting the Somta product range, under the Somta brand, worldwide through their 30+ sales offices, with the Somta range complimenting that of OSG and allowing for much greater market coverage."

"This show underlined again the significance of Somta being a part of the OSG family, not only through the extended reach and synergy, but also because of the immense credibility that goes with the OSG brand."

"Also exciting was that Somta had three of its team visiting EMO for the first time. Shaun Roopnarain (International Sales Manager), Farouk Ismail (international sales) and Dilon Mathavalla (Engineering Manager) were all blown away by the size of the show, the technology on display and the number of competitors in our industry – a clear reminder of the value of being part of the world's largest industrial exhibition. There is always a healthy mix of emotions – ranging from exhilarating to intimidating!"



Allan Connoly, Raj Reddy and Shaun Roopnarain, all of Somta Tools

"As the only exhibitor from Africa, Somta was also privileged to have many of the visitors from South Africa visit its booth and develop growing relationships. There is a lot to do together to develop manufacturing in South Africa and create jobs."

"By the end of the show, Somta had visits from over 150 customers (only 20 of which were existing), representing 47 different countries. The company has many new exciting leads for the sales team to follow up on. The engineering team also came back with some fresh ideas and challenges of how to take the company into the future in terms of technology and best manufacturing practices."

"The cost to exhibit at and visit EMO is high, but this is one show that we believe will reap many rewards for our company."



Hans-Peter Neth of Retecon



Marcus and Kim Funk, both of UTP

► **Matt Mayhew, Matthew & Son**

"Wow EMO!! EMO 2017 was my first visit to the exhibition and to Hannover, Germany. For any South African in the metalworking industry this has to be a pilgrimage to make in your career at least once. I am not an EMO ambassador but looked past the exchange rate and viewed EMO as the cheapest education one can purchase for oneself."

"The ability to see nearly every machine tool builder, probably all your tooling suppliers along with all the latest trends and releases, limitless software options including Industry 4.0, as well as machines you will never get the opportunity to see back here in South Africa, is priceless."

"South Africa is a small market in comparison to the rest of the world but I believe we hold ourselves well and can be proud of what our country produces. We are fortunate to have good suppliers and local agencies for much of the equipment that I witnessed."

"What I took away from EMO 2017 is more than a few brochures, it is confidence in our local manufacturing,



Matthew and Matt Mayhew, both of Matthew & Son

motivation to grow towards our European and global competitors and the self-assurance that the metalworking industry is flourishing."



Pieter Marais and Johnny Appolis, both of Autocast



Willie and Ciska Jones of Jones Masjiene

► **Onelio Barnardt, Carbide Solutions and Innovations**

“EMO never ceases to amaze! From the mind-boggling size of it, to the awe inspiring technology showcased. EMO creates a unique opportunity for us, as we’re able to meet with all our primary suppliers without travelling to each factory scattered all over the globe. All our suppliers launch their latest technology at EMO and 2017 was no exception, thus giving us the opportunity to be exposed to the latest technology.”

“In my opinion one week is not enough time to properly take in all of what EMO has on offer. You must have a clear plan or goal when visiting this exhibition. When following the site map – the layout, grouping and clear stand identification makes seeking out and visiting the areas of interest very easy. I can also compliment the free public transport to and from the exhibition, it was clean, safe and very efficient.”

“One of the highlights of EMO 2017 was definitely the South African gathering. It was an evening of sharing “war stories” and “tricks” of the industry, while having some



Onelio Barnardt and Brandon Mew, both of Carbide Solutions and Innovations

of the best beer in the world! Thank you for arranging this and inviting us to this gathering!”

“EMO never ceases to amaze! From the mind-boggling size of it, to the awe inspiring technology showcased. EMO creates a unique opportunity for us, as we’re able to meet with all our primary suppliers without travelling to each factory scattered all over the globe. All our suppliers launch their latest technology at EMO and 2017 was no exception, thus giving us the opportunity to be exposed to the latest technology.”

► **Chris Kroeger, Retecon**

“Retecon as a group hosted eight staff and 18 customers at the EMO 2017. The feedback from all was very positive with special mention of the advances in technology and the level of automation available in the metalworking industry.”

“Highlights for us were the DMG MORI stand that occupied the whole of Hall 2 with 80 machines that were exhibited. The majority were equipped with various levels of automation, from consolidation of processes to loading and un-loading solutions for workpieces from small to large.”

“Automation requires management tools, and with the open network solution ADAMOS, DMG MORI offers its customers, partners and suppliers a complete digitalisation strategy. CELOS, through ADAMOS and the NETbox is now becoming an open ecosystem for the digital factory.”

“Trumpf also exhibited at EMO and showed their latest machine in 3D laser printing suitable for various metals.”

“Also of interest to us was the new gear grinders from Kapp Niles, Ficep in general, Hexagon Metrology with their



Mario Botha, Schalk Mostert and Chris Kroeger, all of Retecon

various new models as well as the new models from GF Machining Solutions for wire cutting and die sinking.”

“Most of our suppliers showcased their involvement in Industry 4.0 and connectivity in every respect.”

► **Filipe Dos Santos, Perfection Tool & Die**

“The show was a real eye-opener for us, especially as it was my first EMO. I had a plan, which was to focus on automation, software and quality (measuring technologies) and then to just run through everything else in order to absorb as many new technologies and processes as possible. I believe the show was well worth it and I will be implementing a few technologies that were seen at EMO in the near future, which will save our company 100 fold compared to what the trip cost us.”

“On the automation side I left EMO more confused as to what the best automation solution for our products would be as there are so many different options. But I believe automation is necessary for future survival. I was hoping to find a small machine that could machine our parts complete and still be reasonably priced, but the best solution for us is to automate existing machines to become more productive with less handling and to purchase multi-axis/twin spindle machines going forward.”

“On the software side I believe Industry 4.0 is what we should all strive for and this should be implemented on existing machines as well, not just on the new machine tools. Any new machine tools purchased in future must have this capability.”

“We found a particular machine monitoring software to help us in implementing Industry 4.0 in our company, which we are in the process of acquiring.”

“We were also looking for software to aid us in the quoting



Miguel Dos Santos, Jesse Bohn and Filipe Dos Santos, all of Perfection Tool & Die

of machined parts and regret there is nothing that we could find but I was told that something is in the pipeline by many software suppliers we spoke to.”

“I didn’t find anything new and exciting in the quality / measuring technologies halls – we just saw the run of the mill stuff.”

“All in all, I would recommend people who want to grow their business and not keep doing the same old thing, to visit EMO 2019.”



Christa and Pottie Potgieter from Marnic Engineering



Jacques and Vasti Potgieter from Marnic Engineering

► **Dave Aldridge, FEW**

“For a South African owned and run business such as FEW Cutting Tools, the EMO trade fair in Hannover is a must attend exhibition. Trade fairs are in plentiful supply around the world but this one is special and different. It provides a marvellous opportunity to meet suppliers and customers from around the world, and it’s a chance to meet up with old friends, and to make a few new ones.”

“For those of us involved in the cutting tool industry, there is no similar fair that guarantees the prospect of meeting such eminent machinery suppliers, competitors and customers all in one venue.”

As a showcase for leading technologies, EMO offers us the opportunity to be inspired by the latest innovations in machining and tooling. On each occasion we return home with renewed vitality and passion, motivated to continually refine our own technologies to the highest international levels.”

“And, as the fair is in Germany, at the end of a long day investigating far flung halls, there’s always a chance to sample



Konstantin Malinov of Retecon and Dave Aldridge of FEW

a stein or two of that wonderful German beer.”



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► **Mike Saxer, Simera Innovate**

“EMO is by far the biggest metalworking show in the world and an event I have always wanted to attend. With my new ventures I was tasked especially to look at the state of Industry 4.0 in the world. This is the new buzz-word in industry and academia and it is all about improving production efficiency using IoT (Internet of things) to make informed decisions for production processes amongst other things.”

“I wanted to see first hand what the status is around Industry 4.0. Most of my time was spent in high-level meetings with Siemens and DMG MORI, especially around elements of the Digital Factory and how these new tools can assist in the manufacturing environment. The amount of work that has been done around this is astounding and I was given real life use cases to evaluate the status of this in industry.”

“I can only say that being at EMO has opened up my mind to the almost endless possibilities to improve manufacturing efficiency. The level of professionalism that goes into EMO is amazing and I would strongly recommend attending such a show at least once in your life. It is important to have a specific



Mike Saxer of Simera Innovate and Frans Studer of Retecon

focus as in the four days I was there I could only see around half of the 16 halls.”

► **Ron Brown, CSI**

“Once again EMO 2017 has come and gone. They do say all good things come to an end and sadly that is the case with the recent EMO show. This for me was the first EMO show I was privileged enough to attend. The evolution that has taken place in the industry since its inception in 1951 to now is just mind-boggling. Just the sheer size of the exhibition, the 16 halls that the exhibition occupies even though the exhibition ground has 25 halls, is totally overwhelming.”

“Being a first timer, all I wanted to do was visit each and every hall, not realising the magnitude of the exhibition. Luckily I was fortunate enough to spend five days there, which did enable me to get to all the halls.”

“Engineering technology has evolved so rapidly that it’s almost impossible to keep up with all the latest developments. EMO gives one the opportunity to get up to speed, albeit the

shear number of exhibitors prevents you from taking it all in. One cannot explain to a person who has not attended EMO the enormity of what is on display.”

“The amazing grandeur of the stands, the research and development that has gone into these machines to get them to the latest state-of-the-art stage, each exhibitor trying to be better, faster and more affordable than their competitors.”

“For me the most impressive hall was that occupied by DMG MORI. An entire hall containing only their equipment and each machine displayed was more impressive than the next, absolute pure beauty and excellence.”

“Of course the “in house beer hall” is a story for another time. I have never had the pleasure of experiencing anything of this incredible magnitude in my life before and would truly revere the opportunity of being privileged enough to attend this show at any time in the future.”

“Once again EMO 2017 has come and gone. They do say all good things come to an end and sadly that is the case with the recent EMO show. This for me was the first EMO show I was privileged enough to attend. The evolution that has taken place in the industry since its inception in 1951 to now is just mind-boggling. Just the sheer size of the exhibition, the 16 halls that the exhibition occupies even though the exhibition ground has 25 halls, is totally overwhelming.”



Lohan Struwig, Charles Roots and Ron Brown, all of CSI



Oubaas Human of Marnic Engineering with Mathys Besselaar of Retecon

“One of the common trends today is the loading on and unloading of parts from CNC lathes. However, there was also a significant push toward changing over fixtures on machining centers in order to speed up change overs. This also indicates that although volumes are high, flexibility is becoming far more important.”

► **Alroy Savides, PBS Machine Tools**

“Having visited EMO several times in the past I knew what to expect from the different halls and machine manufacturers. There is always a balance between companies trying to flex their muscles and others with higher levels of technology with perhaps less machines on show.”

“The most important thing I have found is to look deeper and ask more difficult to answers questions of the manufacturers. For example, why they have designed a specific machine and what industry or component are they trying to target? There shouldn’t be automation for automation sake. It should be used to fulfill a specific function.”

“One of the common trends today is the loading on and unloading of parts from CNC lathes. However, there was also a significant push toward changing over fixtures on machining centers in order to speed up change overs. This also indicates that although volumes are high, flexibility is becoming far more important.”

“As always the majority of parts shown on machines were either from the automotive or aerospace industries. And although we have these industries in South Africa they are still quite small by comparison.”

“Industry 4.0 was a big theme and almost every stand had



James Huang of PCI with Alroy Savides and Klaas Salomons, both of PBS Machine Tools

some link or innovation that connected the machine to the individual. It is however clearly not that simple. And in a market like ours there needs to be a step further. We need to assess how Industry 4.0 can assist in getting higher efficiencies out of machines? How it can assist us in changing over quicker and planning better? As well as running our machines unmanned.” ■

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Nissan licenses energy-efficient engine technology to Heller

Nissan Motor Co., Ltd. has licensed its Nissan Machining Roughening Process (“NMRP”), a proprietary technology used in making automotive engines, to world-leading German machine tool manufacturer Gebr. Heller Maschinenfabrik GmbH.

By using Heller machinery that incorporates NMRP, carmakers worldwide will be able to mass-produce engines with highly energy-efficient cylinder bores with iron spray coating at a consistent quality level.

“Rather than limiting the use of our own technologies like NMRP within the company, Nissan is contributing to the technological advancement of the industry by making them widely available,” said Catherine Perez, corporate vice president of corporate strategy, partnerships and business development at Nissan.

“Nissan will also advance its research and development by investing the profit gained from licensing assets like NMRP. We expect the licensing of NMRP to Heller will result in improved quality of products and services as well as customer satisfaction in the automotive industry as a whole.”

Conventionally, a tube-shaped cast-iron liner (with a wall thickness of 2.6mm) is inserted into an engine’s cylinder bore, where it serves to protect the reciprocating piston from heat and friction. To reduce engine weight and improve fuel efficiency, automakers have begun replacing cast-iron liners with 0.2 mm-thick iron spray coating — or molten, low-carbon steel, sprayed onto the inner surface — primarily in high-performance and ultralow-emission cars. Also known as “mirror bore coating”



Conventional four-cylinder engine and cast iron liner



Four-cylinder engine with mirror bore coating

for its mirror-like finish, iron spray coating helps manufacturers reduce engine weight and facilitate cooling, significantly boosting energy efficiency without affecting the driving experience.

Engines using iron spray coating, however, are known to be difficult to mass-produce with consistent quality, limiting the technology’s application to a small number of high-end engines. Mass production requires advanced thermal spraying technology as well as technology that ensures the coating stays bonded on the inner surface of the cylinder despite constant explosion and compression.

NMRP is a type of hole-boring process that uses optimised tools and processing conditions to roughen the inner surface of a cylinder bore so that the iron spray coating stays tightly bonded. By combining appropriate thermal spraying technology and NMRP, manufacturers can mass-produce engines with iron spray coating at a consistent quality level, at a relatively affordable price.

Nissan first applied iron spray coating to the VR38DET engine of the Nissan GT-R, and then to low-emission engines for minivans and compact cars including the Nissan Juke 16GT’s MR16DDT and VR30DDTT for Infiniti Q50 and Q60, VQ35DD for Pathfinder and Infiniti QX60, HR12DDR and MR20DD, without limiting its use for high-performance engines.

Heller has been producing and selling machining modules for cylinder bore coating. Nissan’s NMRP license enables Heller to offer a combination of technologies for carmakers to mass-produce engines with iron spray coating. ■

Hexagon acquires Luciad, a leading provider of 5D visualisation and analysis solutions

Hexagon AB has announced the acquisition of Luciad, a Belgian-based software company specialising in the visualisation and analysis of real-time geospatial information.

Luciad’s visualisation technologies support live connections to dynamic sensor feeds in a 3D environment. The result is a 5D digital reality — real-time, rapid fusion of multi-source content and the ability to perform analytics on-the-fly. These intuitive command and control systems benefit all kinds of applications — from public safety to smart cities to defence and intelligence — enabling users to make critical decisions based on changing information in real-time.

“This acquisition strengthens Hexagon’s ability to deliver smart digital realities, enhancing our Smart M.App platform with 3D, 4D (real-time sensor feed integration) and 5D (dynamic analytics) capabilities,” said Hexagon President and CEO Ola Rollén.

“The ability to rapidly integrate sensor data in a visually compelling environment provides the geospatial location intelligence and situational awareness necessary for mission critical operations.”

Luciad has over 100 highly-skilled professionals in eight countries, with over 100 000 users of its technology globally. ■

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Sintavia and Trumpf announce strategic alignment

Fast growing metal additive manufacturer Sintavia and leading machine tool company Trumpf agree to work together on machine qualifications for aerospace applications.

Sintavia, LLC, a leading company for metal additive manufacturing services, and the Trumpf Group, a leading high-technology company offering production solutions in the machine tool and laser sectors, have announced an agreement to work together to accelerate the penetration of Trumpf TruPrint metal printers within the global aerospace industry. The agreement, which involves a Trumpf TruPrint 3000 with industrial part and powder management being installed in Sintavia's Davie, Florida, US manufacturing facility, marks the start of a new strategic alignment for both companies.

"Trumpf is a globally recognised leader within the high

technology tooling and laser industries, and their machine customer support is the best in the world," said Brian R. Neff, Sintavia's Chief Executive Officer.

"Moreover, the TruPrint 3000's build chamber is completely modular and secure — a requirement for Sintavia's new Lean production facility. We are excited to work with Trumpf on the TruPrint 3000, and to grow the relationship into the future."

"Between Trumpf's leadership in precision tool manufacturing and high technology laser applications, and Sintavia's vertically aligned manufacturing platform, we feel that this development is a win-win for both parties," said Ralf Kimmel, General Manager of Trumpf North America.

"The TruPrint 3000 is both scalable and qualifiable, and we look forward to working with Sintavia as it goes through these processes with its numerous aerospace customers."

The two companies have a target installation date for the TruPrint 3000 of early 2018.

About Sintavia

Founded in 2012, Sintavia is the global leader for independent metal AM for critical industries, including Aerospace & Defense, Oil & Natural Gas, Automotive, and Ground Power Generation. With high-speed printers co-located alongside precision post processing equipment, a full complement of mechanical testing equipment, and a full metallurgical and powder laboratory, Sintavia is able to optimise parameters, serially manufacture, and audit quality parts for critical industries. Sintavia is committed to the highest quality standards in the industry, and holds AS9100, ISO17025, and ANAB accreditation, as well as being OASIS registered and ITAR compliant. For more information, go to <http://www.sintavia.com> ■



EU targets China with tough rules on cheap imports

The EU has been under intense pressure from big industry in Europe to keep strong trade defense measures due to China's public subsidies and excess production, especially in steel and other metals, according to Agence France-Presse.

The EU reached a landmark agreement on October 2 on tough new rules against cheap imports in a move that risks embittering already tense relations with Beijing.

The European Commission, EU national governments and MEPs had been in talks since July on new rules to calculate import duties and curb unfair trading practices, especially from China.

"Europe stands for open and fair trade, but we are not naive free traders. Today we strengthened our anti-dumping rules," European Commission chief Jean-Claude Juncker said.

Juncker insisted that the measure was "not about any country in particular and simply about making sure that we have the means to take action against unfair competition."

But the EU has been under intense pressure from big industry in Europe to keep strong trade defense measures due to China's public subsidies and excess production, especially in steel and other metals.

"We believe that the changes agreed today to the legislation strengthen EU's trade defence instruments and will ensure

that our European industry will be well equipped to deal with the unfair competition they face from dumped and subsidised imports," EU Trade Commissioner Cecilia Malmstroem said after talks ended in the eastern French city of Strasbourg.

The new measures are intended to offset the consequences of granting China so-called market economy status at the World Trade Organisation that will make it more difficult to prove illegal trade practices by Beijing.

The topic is so sensitive that China shocked the EU at a summit in June by refusing to endorse a joint statement on climate change out of dissatisfaction on the status issue.

When China joined the World Trade Organisation in 2001, it was written into the terms of the deal that member states could treat it as a non-market economy for 15 years.

Under this regime, the EU and other WTO powers retained powers to unilaterally establish fast and tough anti-dumping rules without infringing WTO rules.

The deadline passed late last year, but the European Union intended to grant the new status once these new rules were in place.

Beijing has said previously that the refusal to grant China market economy status is an example of "covert protectionism" and "double standards" by the West. ■

Salvagnini opens Robotica plant

Incorporates centre of excellence for press brake bending.

Salvagnini Robotica, Salvagnini's new robotic applications project, has opened a modern plant in Brendola, Italy, which is also the centre of excellence for press brake bending. Salvagnini Robotica is the Group's new division for the development and manufacture of press brakes and associated robotic applications.

The birth of Salvagnini Robotica is a new milestone in the Group's evolution, expanding its product range by investing in press brakes 4.0, bending solutions, namely smart solutions aimed at optimising process efficiency. As it happens, it is more and more common for the bending stage to constitute a "bottleneck" in the manufacturing process, a busy crossroads that needs to be crossed in order to make the production flow responsive and ensure it meets the time frames demanded by the market.

Ever-smaller production batches and increasingly extreme turnaround times mean production changes are continuous and frenetic, forcing companies to become flexible and efficient at every stage of the production process, especially downline from cutting, which has reached ever-higher levels of performance in recent years.

A longstanding advocate of innovation geared towards providing solutions to real manufacturing requirements in line with market demands, Salvagnini was quick to see this situation unfolding and thus embarked on a growth path that has culminated in the birth of Salvagnini Robotica, the plant dedicated to the design and manufacture of B3 press brakes and relevant robotic applications.

The new plant has a factory floor space of 4 000m² devoted entirely, for the duration of this start-up stage, to the manufacture of B3 manual press brakes, which currently come in 14 models,

from two to five metres and from 60 to 400 tons. Once the preset target of around a hundred machines per year has been reached, the next step will be the production of robotic applications integrated with the press brakes – Roboformers – which are still being developed.

At the Brendola site everything revolves around the "press brake" product, which has a different design and time frame approach to all the other Salvagnini products. Not surprisingly, then, the first tangible results of the new approach have been an increase in monthly production capacity, which has gone from three to five machines, and a significant reduction in so-called lead-time.

For further information contact PIM Machine Tools on TEL: 011 022 4648 or visit www.industrialmachinery.co.za ■



GF Machining Solutions

buys machine connectivity software developer

Machine tool developer and manufacturer GF Machining Solutions is buying Symmedia GmbH, a privately-owned software developer that specialises in machine connectivity systems. Connecting machines with security is "the basis of the future development of industrial processes," according to GF's statement, in which it also described the acquired company as "a key player in factory digitalisation."

GF Machining Solutions CEO Yves Sera noted that Symmedia will "allow us to speed up and widen the range of the digital solutions we offer to our customers."

The value of the purchase was not revealed.

Other machine tool builders and CNC developers are making similar efforts to customise their technologies' digitalisation functions and capabilities. For example, in addition to developing connectivity programming and devices, Mazak is adapting its manufacturing network to take advantage of the Industry 4.0 initiative.

GFMS is widely recognised for its high-performance milling machines and electric-discharge machines. Notably, however, last year it acquired Microlution Inc., a Chicago-based developer of micromachining products incorporating milling and laser technologies. Now it emphasises that adding Symmedia is a move "in line with its strategy to digitalise its offering."

Symmedia has 60 employees, and it has developed programme software for more than 15 000 machines over 20 years in business.

It will continue to support and develop connectivity solutions for all types and all brands of machines and factory equipment, and GF Machining Solutions will use Symmedia technology to accelerate its digital transformation by offering complete solutions for factory connectivity in industrial environments.

Symmedia will retain its current management and headquarters in Bielefeld, Germany. ■

Siemens and FFG partner for digitalisation strategy

Long-term partnership to integrate enterprise technologies and an open-access, cloud-based IoT operating system for Fair Friend Group's 90 brands.

Siemens and Fair Friend Enterprise Co. Ltd. Taiwan (FFG) have signed a joint Memorandum of Understanding with the intention of strengthening their long-standing business relationship. The aim of the extended partnership is to consolidate the integration of the Siemens Digital Enterprise Suite across the Taiwanese business and to integrate Siemens digitalisation and automation technologies into FFG's machine tools and machine tool technologies.

To this end, Dr. Jimmy Chu, FFG Chairman, and Dr. Wolfgang Heuring, CEO of Siemens AG's Motion Control Business Unit, signed the memorandum at EMO 2017. The two businesses agreed to work closely together in the future on the consolidation of the Siemens Digital Enterprise Suite and the cloud-based Internet of Things (IoT) operating system MindSphere at FFG. Thanks to its open-access structure, MindSphere is said to enable machine manufacturers to use their domain expertise in developing high-performance applications for machine operators, forming the basis of new services and business models.

The intensified cooperation will also include Siemens' Product Lifecycle Management (PLM), Manufacturing Operations Management (MOM) and Totally Integrated Automation (TIA) domains.

In previous years, Siemens and FFG have developed concepts independently of each other in the field of digitalisation and automation for machine tools. The Digital Enterprise portfolio from Siemens offers core elements of industrial software and automation, industrial communication systems, security and services as well as cloud-based IoT technologies. Siemens will

primarily bring its expertise in machine control and automation technology to the concepts to be developed.

"As a leading international manufacturer of machine tools and globally active business, FFG is constantly looking to meet the challenges of digitalisation and to convert the business to a digital company," said Dr. Chu.

"Siemens' global setup, with its all-encompassing and pioneering Digital Enterprise concept and its leading future-oriented technologies for Intelligent Manufacturing and the Factory of the Future, is therefore an excellent partner for FFG."

"Our two companies have been working together for many years on a basis of trust and with a common theme: A passion for machine tools. Putting this collaboration on a broader footing from now on against the background of the opportunities provided by digitalisation is a seminal and important step for both companies," said Dr. Heuring.

Fair Friend Group is an industrial conglomerate with over 90 companies operating in the fields of machine tool technology, PCB, industrial equipment and green technology. Founded in 1979 in Taiwan, FFG developed into the largest local machine tool manufacturer with major brands like Feeler, Leadwell, Sanco and Equiptop.

From 1989, the growth strategy included international acquisitions in the USA, Italy, Germany, Japan, India, South Korea, and Switzerland. The acquisitions included leading manufacturing technology companies like VDF Boehringer, DMC, Hessapp, Honsberg, Ikegai, Jobs, MAG, Meccanodora, Modul, Morara, Pfiffner, Rambaudi, Sachman, Sigma, SNK, Tacchella, and Witzig & Frank. ■

SLM Solutions expands dealer network in Africa

SLM Solutions, the German 3D printing hardware manufacturer, has partnered with a South African reseller company as it expands its dealer network.

Metal Heart Additive Technology Africa will distribute the company's Selective Laser Melting (SLM) platforms across the country and provide advice and support as and when required. The South African outfit has been working intensively with SLM technology since 2014, and will now add the offerings of SLM Solutions to its portfolio. There has already been interest in the SLM 280 systems, with several orders placed from varying industries and sectors. SLM Solutions selected Metal Heart as it pursued a partner who can provide extensive advice to the 'many interested companies' in SLM additive manufacturing in South Africa.

"We are pleased that we have been able to expand our dealer



network to the African market," said Stefan Ritt, Vice President and Head of Global Marketing and Communications at SLM Solutions Group AG. "We find the performance and vision of Metal Heart to be very convincing. It is our pleasure to have this reliable company at our side as a partner in our dealer network now."

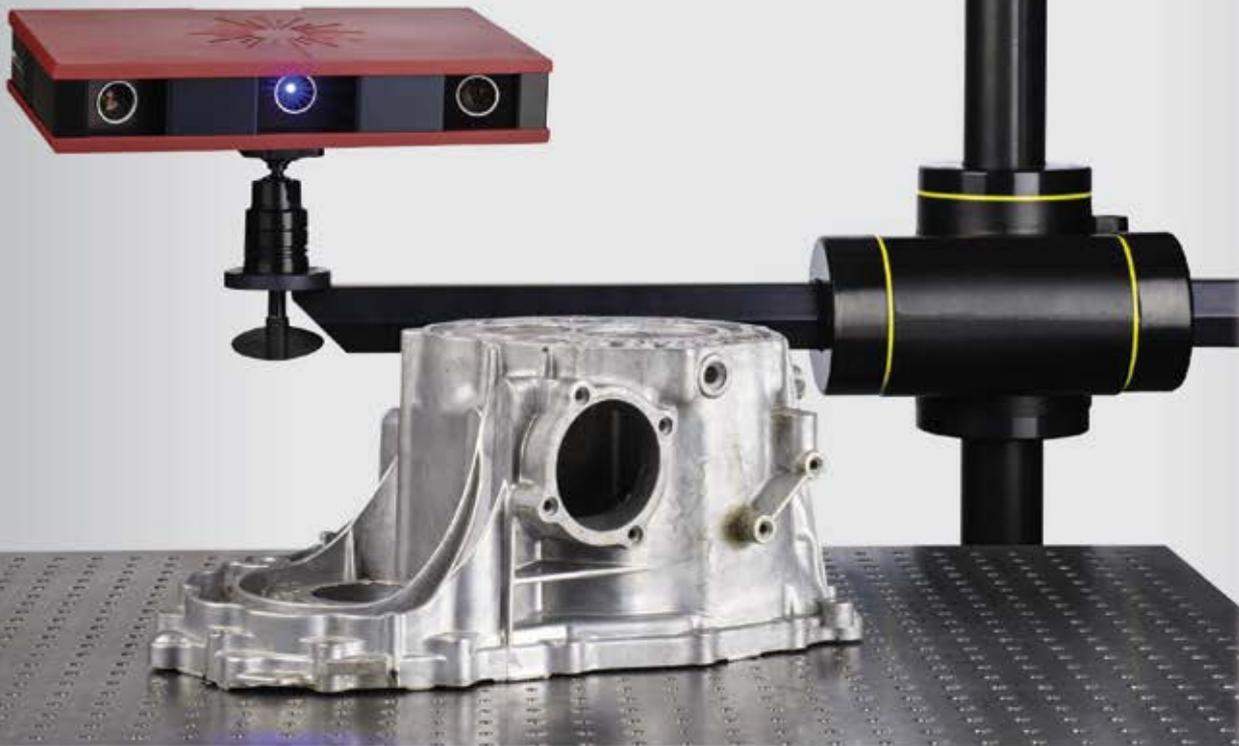
"We are delighted that our current and prospective customers can now benefit from the advantages of additive manufacturing processes in their production process in South Africa," added Gerrie Lombaard, Executive Director of Metal Heart, Additive Technology Africa. "We place great value on comprehensive consulting. We combine our knowledge of the sector with our expertise in SLM technology. As a result, new solutions will be implemented in Africa that were inconceivable until recently." ■

International Workshop

3D Metrology in Castings

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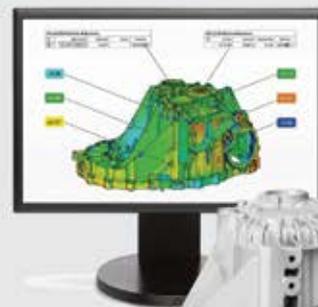
Measuring systems from GOM are used in sand, pressure die and investment casting processes to guarantee consistent quality assurance: from simulation verification, via accelerating tool-try-out and first article inspection, up to production control and CNC machining.



GOM systems allow for inspection planning based on construction data. In pattern and mould making, targeted tool correction and inspection of fitting for mould halves, core allowance and sliders are possible. During try-out, cast parts are checked for shape and dimension, component geometry, material thickness, shrinkage and warpage. For series-accompanying quality control, all measurement and inspection processes are automated.

GOM workshops are an industrial meeting platform for design engineers, tool makers as well as specialists from research & development, production, and quality assurance. They provide insight into:

- Models and Pattern Plates
- Tools, Cores and Moulds
- Cast Parts



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OrderFox.com helps shops compete in an online marketplace

OrderFox.com is an online platform for the CNC industry, connecting CNC manufacturers, buyers and their suppliers on a global scale.

The speed and complexity of the CNC business is growing with the progression of digitisation and Industry 4.0. All business processes, horizontal and vertical, are becoming more efficient. For CNC manufacturers and buyers alike, digital networking is becoming an indispensable platform for keeping up within the competitive landscape. The innovative nature of OrderFox.com provides support to businesses by helping them prepare, grow and move towards a more efficient digital future.

One such example is that OrderFox.com provides its users with a large network of contacts for more potential business that they may not have had access to before. At the same time, valuable sector and industry expertise is continuously updated, added and shared by leading industry experts and companies, providing additional growth opportunities and benefits within the network. Quick access to knowledge, market information and suitable business partners has become a crucial success factor in the high-speed Industry 4.0 environment.

OrderFox.com is becoming the world's largest CNC database providing CNC manufacturers and buyers with new business opportunities. CNC manufacturers can search for and find both local and global CNC jobs for free. Buyers can place CNC jobs on the platform, as well as update and optimise their network of suppliers. OrderFox.com is more than just a comprehensive database of CNC manufacturers and buyers.

Both buyers and sellers also receive a wide range of regular reports and analyses, which provide great added



value. They include current and future trends, and important facts and figures about the market. This information is invaluable for buyers and CNC manufacturers, as it can provide guidance in making investment decisions with more certainty.

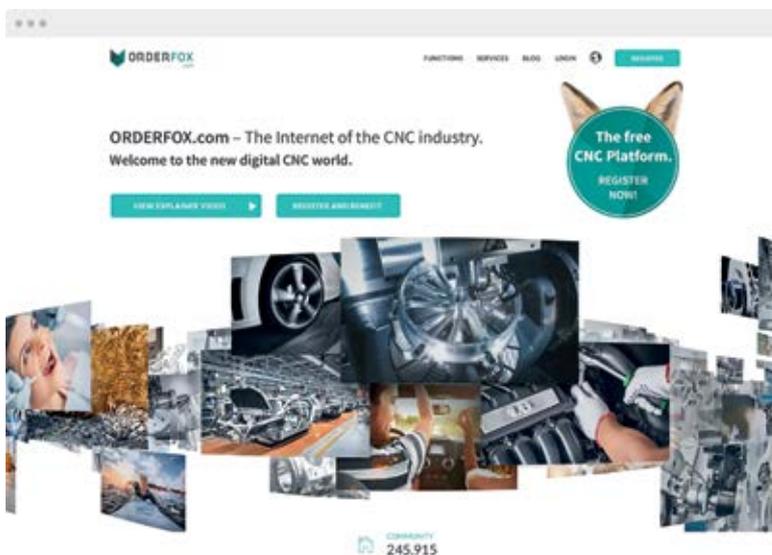
The platform helps shops to find work for unused machines, fulfill customer orders when they unexpectedly reach capacity and expand their customer bases. It also provides a pathway for buyers to help find additional partners and resources on both a local and global scale.

According to the company, the platform is a search engine, like Google, but specifically developed for the CNC industry. CNC manufacturers can use OrderFox.com to search for new jobs on short notice, to outsource jobs, or to search for jobs that meet specific criteria through filter functions. Buyers can quickly find qualified partners on both a local and global scale. The platform enables a company to update and optimise its network of suppliers continuously, creating long-term, reliable and qualified partnerships.

The company says that OrderFox.com is the only global CNC platform of its type. The latest membership numbers from the database shows that by EMO 2017 OrderFox.com had more than 240 000 participants in its community from Europe, Asia and America. During the six days of the trade fair 1 489 companies collected information directly from the OrderFox.com stand.

OrderFox.com's new Premium Partner Programme is a marketing partnership for machine tool manufacturers, suppliers of automation, suppliers of measurement technology, tool manufacturers, lubricant manufacturers, and also for general service companies in the areas of fleet management, facility management and recruitment.

For further details visit www.orderfox.com



Dyson will build 'radically different' electric car by 2020

Vacuum maker Dyson to invest \$2.7 billion — half of the money will be going into the development of the solid state batteries.

Dyson, best-known as a manufacturer of vacuum cleaners, hand driers and air filters, have announced that they will build an electric car by 2020, founder James Dyson said recently.

"There's no point doing something that looks like everyone else's. It is not a sports car and not a very cheap car," said James Dyson.

The company is investing one billion pounds (US\$1.34 billion) to develop the car, plus the same sum to create solid-state batteries to power it, Dyson said. These investments will dwarf money the company is spending on research and development for its vacuums and air filters.

Dyson is joining a crowded field, with manufacturers from Volkswagen AG and Daimler AG to Toyota Motor Corp. and Elon Musk's Tesla Inc. all competing to popularise electric vehicles. While most of these companies are using lithium-ion batteries



There are many versions of what the Dyson electric car will look like

in their current models, Dyson said its car would use solid-state batteries that are smaller, more efficient, easier to charge and potentially easier to recycle. Toyota is also working to commercialise solid-state batteries and said earlier this year that it hopes to have them in its electric vehicles by 2020 too.

Dyson said his electric car would be "radically different" than those being designed by other car makers, including Tesla.

"There's no point doing something that looks like everyone else's," he said. "It is not a sports car and not a very cheap car."

He said he hopes the vehicle will be just the first of a line of electric vehicles from Dyson and predicted that within a few years electric cars would be the largest source of revenue for the company, eclipsing its existing products. ■

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Airbus installs first 3D printed titanium bracket on commercial A350 XWB aircraft

Aircraft manufacturer, Airbus has installed a 3D printed titanium bracket on its series production commercial aircraft, the A350 XWB. The component was manufactured by Arconic, an advanced manufacturing and engineering company, who has struck a partnership with Airbus to additively manufacture components for its latest widebody aircraft.

This installation is resultant of that partnership, and represents the first 3D printed component to be implemented on an Airbus commercial aircraft. It comes after a series of installations of similar parts on test aircraft. The partners believe this is a significant step, and have hinted at what's to follow, revealing that a number of complex 3D printed parts, such as cabin brackets and bleed pipes, have already been flown on Airbus A320neo and A350 XWB test aeroplanes.

"Arconic is proud to partner with Airbus to advance aerospace additive manufacturing," said Jeremy Halford, President of Arconic Titanium and Engineered Products. "Our comprehensive capabilities, from materials science leadership to qualification expertise, helped make this achievement possible. We look forward to continuing to advance the art of the possible in additive for aerospace."

Airbus has been a trailblazing company in the adoption of 3D printing and 3D printed parts for the aerospace industry. In addition to Arconic, Airbus has also aligned itself with Stratasys, who in 2015 revealed more than 1,000 3D printed parts were manufactured for the A350 XWB, and the company's Direct Manufacturing subsidiary to print parts in ULTEM 9085 for the same aircraft. Other partnerships with 3D printing leaders include one with Materialise which was announced in 2015 and one with Sciaci in December 2016.



Ceratizit acquires Komet Group

The Ceratizit Group, headquartered in Mamer, Luxembourg, has acquired the Komet Group, headquartered in Besigheim, Germany.

The acquisition became effective on 12 October 2017 with the transaction still subject to the approval of the antitrust authorities.

Explains Komet Group chief Dr. Christof Bönsch: "The disruptive changes in the market environment pose enormous challenges for Komet. The acquisition by Ceratizit now opens up new opportunities for sustainable growth. The takeover sees the emergence of a new global player with superior technology expertise and broad market access."

The two groups say that the acquisition will make Komet stronger while it also plays a "pivotal" role in the Ceratizit Group's cutting tools strategy with customers having an even

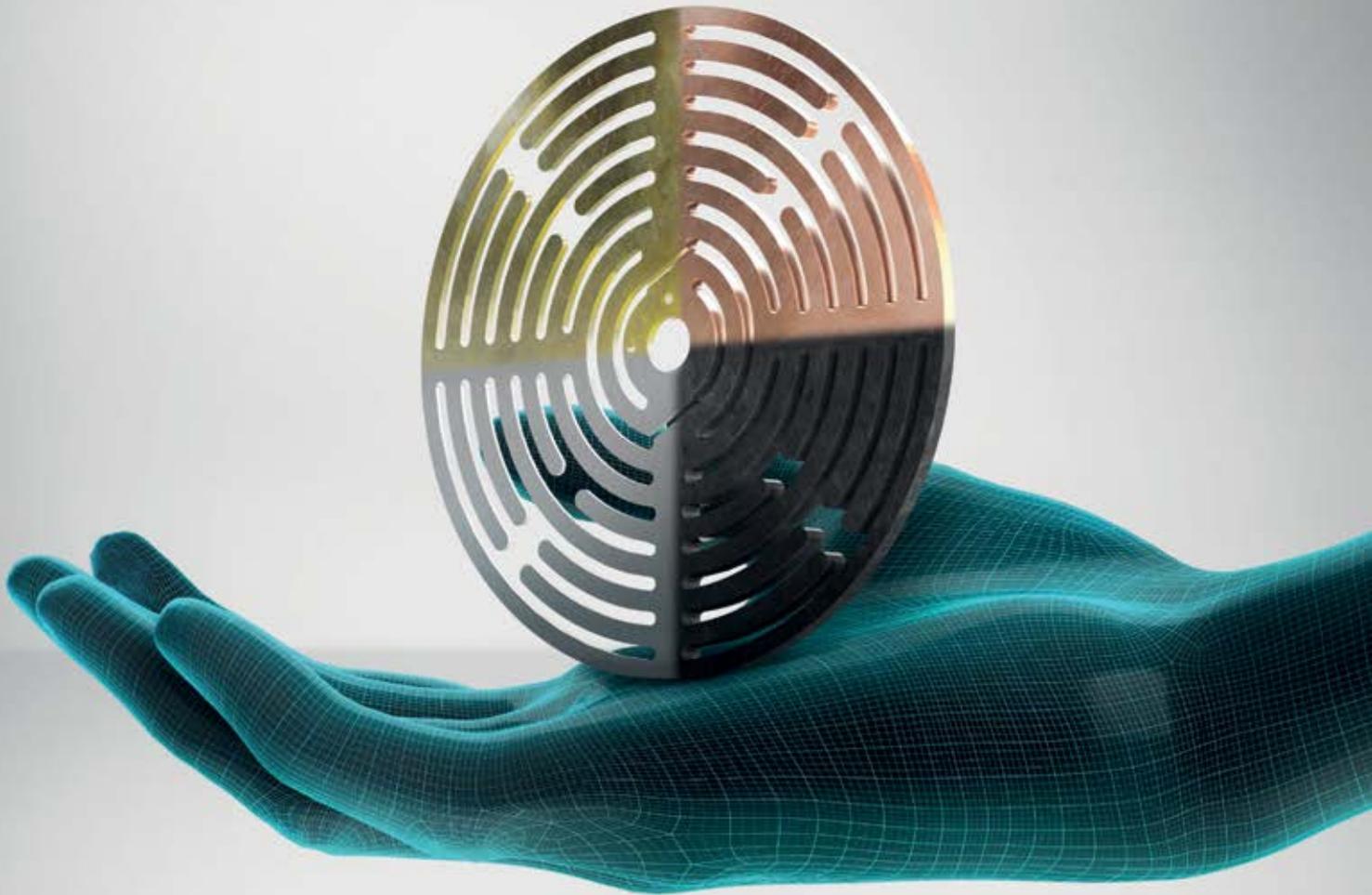
stronger partner in all areas of cutting tools technology. They add that Ceratizit and Komet, together, "will become one of the top five global players in the international cutting tools market".

Adds Ceratizit Group executive board chairman Jacques Lanners: "This move lifts the close and long-standing partnership between the two companies to a new level. It opens up completely new prospects both for our customers and our employees."

Together Ceratizit and Komet have more than 9 000 employees at 34 production sites worldwide and the product portfolio covers all major cutting tools technologies. Subsidiaries in the Group include WNT, Günther Wirth and CB-Ceratizit as well as the tool manufacturers Promax Tools, Klenk, Cobra Carbide India, Becker Diamantwerkzeuge and Best Carbide Cutting Tools.

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Hurco shows just how CNC machining centers can further improve your performance by adding a rotary table as a fourth axis

At EMO 2017 Hurco demonstrated how 3-axis CNC machining centers in its VMXi series can further improve your milling performance with the addition of a Kitagawa GT 200 rotary table as a fourth axis.

Hurco is sure that the highly efficient machining centers in its VMXi series will help increase profitability, especially when it comes to one-off part or small series production. A major advantage of the VMXi machines is their compact construction.

“For example, you don’t need much space to set up a VMX 30i, but it has a comparatively generous working area and cutting performance that is something to be proud of,” said Michael Auer, Managing Director of Hurco GmbH.

The addition of a Kitagawa GT 200 rotary table as a fourth axis significantly increases the range of applications these CNC 3-axis machining centers are capable of. When you start the programme, up to four

sides of a component can be machined at once, without reclamping, and if surface machining is needed on circular components, it can do that too. The additional axis can be installed or uninstalled with ease, to suit current needs.

Conversational control system: Fast, accurate and easy to use

Hurco’s machining centers are equipped with the “WinMax” conversational control system, with optional DXF. The powerful control system software simplifies programming and sets the machine up for



Hurco’s VMX 30i

producing precision parts in just three steps.

“Using our WinMax DXF software, the programming time for a workpiece can be as little as half that of other dialogue programming systems,” said Auer.

Loading and unloading Hurco machining centers automatically

Hurco also demonstrated how cooperation between a machine tool and a loading robot ensures greater efficiency in production. For example, the VMX 30Ui CNC machining center will be loaded and unloaded using an automated system featuring a loading robot from the Dutch provider BMO. This increases productivity while saving on human resources.

“This flexible system enables the expansion of the multi-shift operation in single-piece and small series production without having to increase personnel expense for machine operation,” explained Auer.

Hurco opted for the “Titanium” BMO system. This system allows a CNC machining center to be docked on both the left and right. Blanks are fed in the loading robot cell on trays. The robot arm integrated into the cell positions the blanks in the machining center, removes them after production and places them back into trays in the cell.

“The operator loads the racks of the cell, programmes the machine tool, starts the programme and can then watch the system during operation,” explained Auer.

For further details contact Hurco South Africa on TEL: 849 5600 or visit www.HURCO.co.za



The BMO automated system



BMO-System Titanium: The operator loads the racks of the cell, programmes the machine tool, starts the programme and can then watch the system during operation

METALWORKING NEWS



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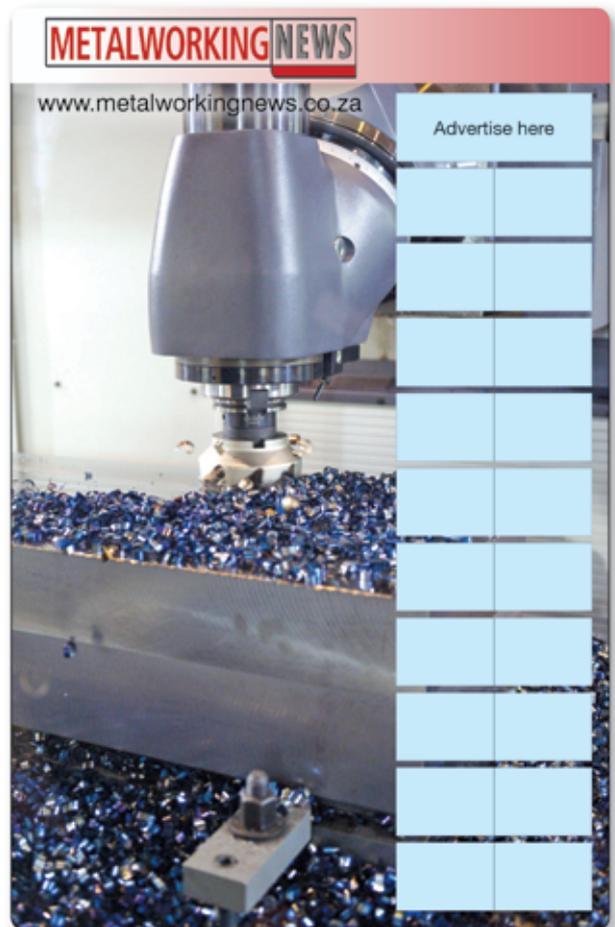
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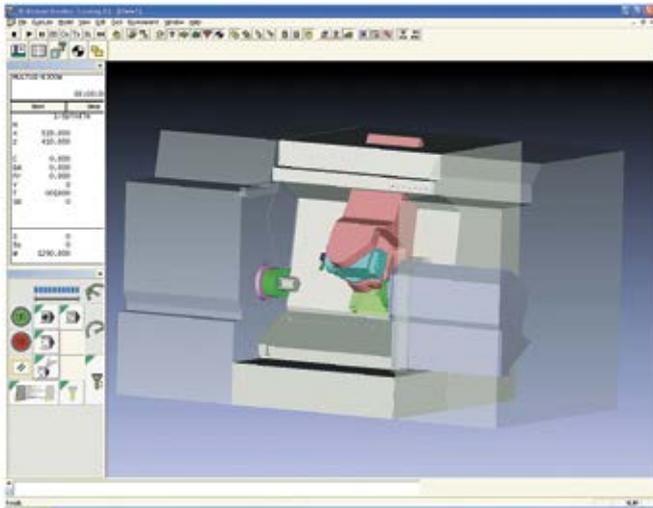
Okuma introduces smart factory solution

Okuma introduced its solution for the smart production called Connect Plan at EMO Hannover 2017. Connect plan is a complete solution that enables advanced factory visualisation, data processing and analysis as well as predictive maintenance. According to Okuma, the solution was created to maximise the potential of production facilities by increasing productivity and flexibility.

Okuma's Factory Monitor, a part of Connect Plan, allows



Okuma's Factory Monitor, a part of Connect Plan, allows visualisation of the entire plant, displaying the utilisation status of each machine



Okuma's Connect Plan include the 3D Virtual Monitor, offering three-dimensional machining simulations

visualisation of the entire plant, displaying the utilisation status of each machine, Okuma announced. In case of a machine failure, the system can automatically notify the operator via e-mail.

Additionally, the Factory Monitor is said to collect and process vast amounts of data. This enables operators to make adjustments to maximise productivity, Okuma says. The operating histories show exactly when, for how long and to what result a machine tool was used. Other features of Okuma's Connect Plan include the 3D Virtual Monitor, offering three-dimensional machining simulations, the ID control for workpiece tracking, and an on-board ODP-AI, that can predict potential trouble and schedule maintenance without disturbing the production.

For more information contact F & H Machine Tools on TEL: 011 397 4050 or visit www.fhmt.co.za

DMG MORI CNC sliding-head multi-spindle autos launched

DMG MORI has combined the speed of multi-spindle automatic turn-milling with the versatility of sliding-headstock (Swiss-type) technology to launch two new machines with up to 41 CNC axes at this year's EMO machine tool show. The multis are manufactured at the group's recently remodernised Gildemeister Italiana factory in Brembate di Sopra, Italy, which has experience of delivering more than 5 000 fixed-head multi-spindle autos.

In a compact footprint of 21.9m² including proprietary bar magazine and high pressure coolant system, the Multisprint 25 and Multisprint 36 are capable of manufacturing components from bar up to 25mm and 36mm diameter respectively. The larger machine can also turn chuck parts up to 50mm diameter, a process that can be automated by one or two robots in the working area.

Driven tools and a 100mm Y-axis on the cross-slides at each of the six spindle positions allow highly complex workpieces to be completely machined with up to 28 standard tools, 24 of which may be driven. X-axis travel is 50mm and



Z-axis travel is 100mm, or 180mm in combination with DMG MORI's SWISSTYPEkit including driven guide bush. Converting the lathes for long part turning takes less than two hours. Maximum rotational speed of the spindles is 7 500rpm, while driven tools rated at 13 800rpm / 14.2 Nm provide considerable versatility of production.

For rear machining, Multisprint machines can be optionally equipped with a pick-up spindle or one or two counter spindles, allowing cycle time reductions of up to 35 per cent through one-hit production. The pick-up spindle moves 230mm along the Z-axis. The counter spindles, which index in 0.002-degree increments, move 280mm in X, 320mm in Y and 370mm in Z. Machining is completed using a double-end working station with three driven and two fixed tools. Control is provided by a Fanuc series 30i.

Nozzles used in fluid mechanics, dental implants and shafts for vehicle manufacture are just a few examples of parts that can be produced highly efficiently.

For more information contact Retecon Machine Tools on TEL: 011 976 8600 or visit www.retecon.co.za

Mitsubishi Electric introduces MV-R Connect wire cutting machines with new-generation control

Mitsubishi Electric unveiled two wire cutting machines with a new control and simplified operation at EMO 2017. A new option that displays the output of numeric values as easy-to-read graphics – much like in an aircraft’s cockpit – is now available.

“Operation has to be simple, quick and flexible so that the user is able to achieve precise results with little effort – even when working to the highest standards,” explained Hans-Jürgen Pelzers, Sales Manager Europe, Mitsubishi Electric.

The new manual control box of the MV-R Connect features a bright, user-configurable display and is equipped with all the important functions. With a freely rotating and pivoting 480mm multi-touch display, the operator can comfortably make settings according to his needs.

Thanks to the built-in cost and performance monitor, the operator can analyse machine profitability and uncover reserves to optimise processes and boost efficiency at all times. Diagrams depict operating costs and output. All operating material statuses and maintenance cycles can be called up at a touch – and, if desired, read out. The machine comes with a network connection, USB, FTP, DNC and open data interfaces, and can be linked up to existing production planning and analysis systems.

In tune with the anticipated future requirements of Industry 4.0, the abundance of processable data available with these machines ensures transparency throughout the production stages. Intel Security is pre-integrated to provide security. Product Manager Stephan Barg says: “Transparent



Transparent production is now possible and is proving to be appreciably more profitable and cheaper with the MV-R Connect series

production is now possible and is proving to be appreciably more profitable and cheaper with the MV-R Connect series.”

The newly designed Job Planner makes it possible to simply bring forward urgent jobs, with automatic saving of the parameters of the interrupted jobs; meaning work can be resumed later on, immediately from the point of interruption. Countering the shortage of skilled labour, the control guides less experienced users through the cutting process step-by-step and thereby teaches them the points to bear in mind while they are working.

Expert mode takes a more direct approach, and the flexible configurability of the control interface makes it possible to attune the machine entirely to typical applications and the operator’s personal focus. The new machines – the MV1200R Connect and the MV2400R Connect – premiered at EMO 2017.

For further details contact WD Hearn Machine Tools on TEL: 021 534 5351 or visit www.wdhearn.co.za



Thanks to the built-in cost and performance monitor, the operator can analyse machine profitability and uncover reserves to optimise processes and boost efficiency at all times

The new Industry 4.0 way to connect with Iscar



Iscar offers several Industry 4.0 standard digital tools, which enable accessing data and making machining calculations easy and readily available.

Download Iscar's best cutting tool recommendations and cutting data from anywhere and at any time. The Iscar Tool Advisor (ITA) will automatically calculate the preferred cutting tools for the job. All that you have to do is enter a few machining parameters.

The ITA is an Industry 4.0 standard and is a user-friendly, cyber-based tool selection software that uses a unique mathematical algorithm. The tool selection process maximises productivity and is based on objective technical data as opposed to an intuitive method of search. For this fourth industrial revolution, it is the optimal tool advisor based on application parameters and available machine power. It works in conjunction with Iscar's electronic catalogue, from where the tool parameters are accessed and used for continuing machine processing. The ITA also includes sub-applications such as Machining Power, Grades and Chipformer selection tools.

Iscar's tool advisor reduces tooling scenarios while accounting for cutting conditions, workpiece material, machine power and metal removal rates. The ITA places emphasis on customer profitability while assuring the right method of tool search for

any application. To receive quick results, users need to enter only a few mandatory fields (2 to 6). For more detailed data, users can complete additional detailed fields specifying machine parameters, tool diameters, tool type, and workpiece material. The calculations will present the three most recommended tool selection results. Up to 24 additional tool recommendations will be available. The results include tool details, insert details, cutting conditions, power, metal removal rate and cutting time. ITA supports both inch and metric platforms and supports 25 different languages.

Users may navigate to Iscar ITA while using www.iscar.com or use a direct link: <http://www.iscar.com/ita/MainPage.aspx>.

In addition to ITA, Iscar's Complete Machining Solutions electronic catalogue is a search engine with multi-tasking capabilities. It enables fast searching for all Iscar tools and inserts and shows parametric values alongside technical specifications. The electronic catalogue is constantly updated and provides users with the very latest guide information.

The Iscar electronic catalogue displays 2D and 3D tool models, pictures and links to product videos. It also provides an



anti-collision and verification tool path for CAD-Cam users. The ITA software is available free of charge, 24 hours a day, 7 days a week, with a direct connection to an ITA support team member.

To connect with the ITA software, click on www.iscar.com or use the direct link: <http://www.iscar.com/ita/MainPage.aspx>.

To meet the growing standards of the Industry 4.0 era, Iscar has launched additional apps aside from the ITA, to assist its many users in their daily routines of metal cutting. Iscar is present on the Machining Cloud application where cutting tool assemblies can be built quickly and easily. The IQ Cloud is available through the Machining Cloud application and is designed for desktop computers and popular tablets. The Iscar IQ Cloud enables programmers to build and download 3D assembly models for CAD CAM users. The Tool Selector section of the application provides users with a method of selecting cutting tools from a tree structure using either a hierarchy or parametric search.

Iscar's Catalogue Application offers many hundreds of technical pages and user guide information, which appear in the main Iscar hard copy catalogs and are available for downloading from the App Store or Google Play. The electronic catalogue pages feature the same interface used in the paper catalogs, with an additional search method for users who seek online or offline catalog related information.

"Industrealize" is an added Industry 4.0 feature on the Iscar website. Industrealize provides explanations and illustrative animations, which depict industry oriented metalworking processes in a vivid and descriptive manner. The Industrealize section shows popular metalworking applications

for many industry sectors such as automotive, aerospace, die & mold, oil and gas, medical and many more industries associated with metal cutting. The Industrealize section also recommends the best tools for each application type.

To learn more, click on www.iscar.com or use the direct link: <http://www.iscar.com/newarticles.aspx/countryid/1/newarticleid/179>.

Iscar's new Matrix is an additional Industry 4.0 tool management system to control inventory, streamline purchasing and drive down costs.

Matrix combines the most innovative automated tool dispenser with Matrix-TM, a powerful management software programme. Access to an item stored in Matrix's locked bins is electronically controlled by the management software according to pre-defined authorisations. Flexibility is the key to any storage solution and Matrix excels. Modular drawer and bin configurations can be exchanged for different bins, giving the user an infinite number drawer of configurations. Add-on cabinets for additional space may be connected with a click of a cable. Multiple cabinets can be deployed in different locations and networked to run from one common database.

This system is a truly modular and comes in different sizes and configurations, with the possibility to grow as your needs change. Matrix technology includes: *Patented locking system, *Touchscreen, *Plug & play "smart" electronics, *Ergonomic design and *Remote diagnostics.

To learn more click on www.iscar.com or use the direct link: <http://www.ctms-imc.com/index.php/en/home/>

For further details contact Iscar South Africa on TEL: 011 997 2700 or visit www.iscar.com ■

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Mazak debuts five new vertical machining centers at EMO 2017

Four new vertical machining centers made their world debuts on the Yamazaki Mazak stand at EMO 2017, while a further machine was exhibited in Europe for the first time.

One of the stand-out machines on display will be the VTC 800/30SR, a UK-built machine capable of full 5-axis contouring equipped, for the first time, with SmoothX CNC. The machine, which is aimed at the general subcontracting, aerospace and automotive markets, has a vertical travelling column construction, ideally suited to the machining of extremely long and heavy workpieces.

Maximum productivity is provided by the high-speed 18 000rpm 35kW (50% ED) milling spindle. The spindle head incorporates a swiveling B-axis, which in conjunction with the NC rotary table, offers full 5-axis simultaneous machining. The Mazak NC rotary table offers further versatility with vertical or horizontal mounting options on either the left or right side of the machine. Accuracy and repeatability for both rotary axes are assured by a backlash-free roller gear cam design. Maximum flexibility is achieved with an optional center partition, which enables the long machine table to be transformed into two separate work areas.

The VTC 800/20SR is equipped with a Sinumerik 840D SL control, for those machine users who have standardised their



One of the stand-out machines on display was the VTC 800/30SR, a UK-built machine capable of full 5-axis contouring equipped, for the first time, with SmoothX CNC

operations on Siemens control. The 800/20SR is equipped with an 18 000 rpm 44.4kW (S6-25%) main spindle and delivers rapid traverse rates of 50m/min in the XYZ-axes. Like its sister machine, the 800/30SR, it comes equipped with an automatic tool changer with 30 tools as standard.

The final VTC series machine that made its world debut was the VTC-760C, equipped with Siemens 828D control. The travelling column design provides optimum machining flexibility including a dual load configuration. The machine is compact with a long X-axis stroke and large 2 300mm fixed table that provides excellent stability. Most importantly, the VTC-760C is a highly productive machine, powered by a 12 000 rpm 16kW (S6-25%) spindle and rapid traverse rates of 42m/min in the XYZ axes.

A further machine being launched for the first time worldwide on the Mazak stand was the VCN-530C, a UK-built vertical machining center powered by a high-speed 18 000 rpm milling spindle. The high-speed spindle package includes ballscrew cooling on XYZ axes, which is complimented by Mazak's Intelligent Thermal Shield to ensure stable machining accuracy.

The machine reduces cycle times with high-speed feed-rates up to 42m/min, outstanding acceleration and deceleration capabilities and a rapid chip-to-chip time of 2.8 seconds.

Excellent accessibility to the machining envelope is achieved with two wide-opening front doors and machine stability is ensured by durable linear roller guides on all the axes. The VCN-530C is equipped with SmoothG control.

During the exhibition, all VTC and VCN machines were connected live on the stand as part of Mazak's newly unveiled ▶



A world debut at EMO for the VCN-530C, a UK-built vertical machining center powered by a high-speed 18 000 rpm milling spindle



VTC-760C with Siemens control



The Primos 400 SG

Industry 4.0 infrastructure, the iSMART Factory concept, which was launched at EMO. This enabled the machines to display real-time working production information to visitors, evidencing how the technology can facilitate the sharing of manufacturing data between the production floor and management suite networks.

During the exhibition, Mazak gave a European debut to its new vertical center Primos 400 SG machine in the two-pallet changer format. Manufactured in Singapore, the Primos is a vertical machining center with a compact spindle taper

designed for a wide range of machining operations, which makes it ideal for the general subcontracting market.

The Primos is a compact design for ease of operation and maintenance, including the use of a fixed structure table for the efficient removal of chips from the machining zone. It is equipped with a high speed, high precision compact 30 taper spindle, ideal for the handling of small parts in volume manufacturing operations.

For more information contact Hi-Tech Machine Tools on TEL: 011 608 0088 or visit www.hitech.co.za

OSG's CC or Control Chip tap series designed specifically for stainless steel

Able to tap stainless steel with water soluble coolant.

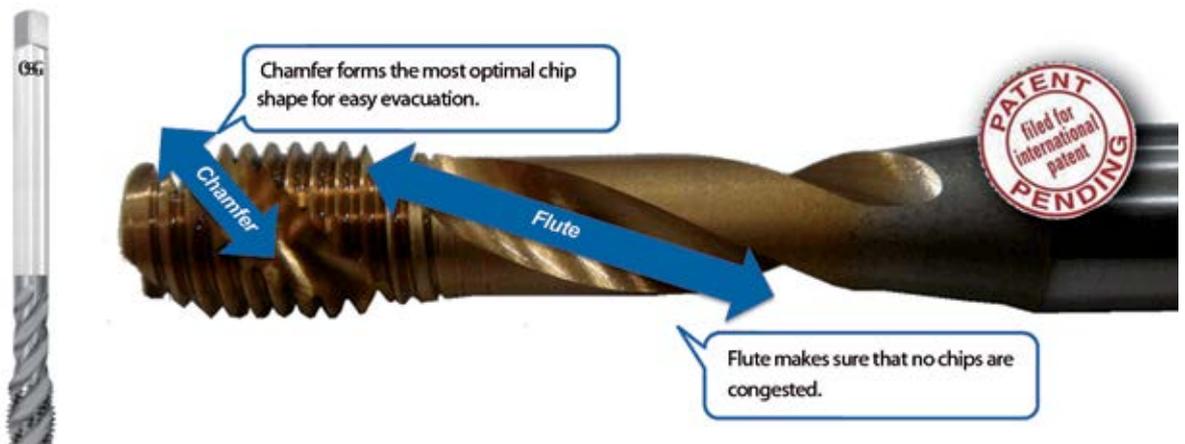
OSG's CC or Control Chip series is a range of taps that are designed specifically for stainless steel. These taps offer 16mm 2D tapping lengths, Ø 6.8 hole sizes, 8 m/min tapping speeds, and M8 x 1.25 interior thread size.

The CC series is chamfer designed to form the most optimal chip shape for easy evacuation and flute designed to make sure that no chips are congested. Additionally, chip shapes are more stable when flute sizes are small and they work well with the characteristics of stainless steel materials. Another feature of the CC series is that the

proven TiN Coating (CC-NEO-SFT) achieves longer tool life.

In order to suit varying user specifications, the CC series offers different tap versions including a blind hole model, through hole models, helicoil models and gas models.

For further details contact Somta Tools on TEL: 011 390 8700 or visit www.somta.co.za



Mitsubishi Materials MS6015 — New insert grade for turning small parts

To improve performance when conducting small part machining, Mitsubishi Materials has now introduced a new insert grade to its comprehensive precision turning line-up. Ideal for sliding head turning centers and intricate machining, the new MS6015 grade is the insert of choice for carbon and free cutting steels.

The new PVD coated carbide grade combines a special carbide substrate with a newly developed PVD coating that significantly improves wear resistance for prolonged tool life that meets the demands of manufacturers conducting long series machining and lights-out production. Unlike conventional TiAlN grades, the new MS6015 utilises an innovative TiCN multi-layered coating with hardness beyond 3000HV. This new layer technology delivers superior wear and welding resistance to provide the best possible machining results.

Furthermore, the new MS6015 has an extremely low coefficient of friction that prevents edge build-up and guarantees that swarf flows smoothly away from the cutting area. By ensuring that chips are discharged effectively, customers will witness significantly improved productivity, tool life and performance whilst having the confidence that swarf will not become entangled and be guided away from the machined components.

Mitsubishi Materials has also developed this impressive new grade with a minus corner radius tolerance to ensure precision corner geometry on workpieces.

The minus tolerance is available with designations 01M, 02M and 04M that have a precision corner radii of 0.08mm, 0.18mm and 0.38mm respectively. The new grade has been launched with three chipbreakers that accommodate the diverse demands of modern applications. The R-SS chipbreaker has been specified for light machining operations on automatic turning centers. The parallel chipbreaker provides exceptional chip control when machining at low feed rates whilst the R-SN breaker focuses on the needs of low to medium feed rates.

For more versatile back-turning and copy turning, the SMG chipbreaker incorporates a 3D moulded breaker that provides an extremely sharp cutting action with unsurpassed chip control when undertaking long production runs. Capable of machining at speeds below 150m/min with feed rates up to 0.15mm/rev, the 7-degree positive inserts are currently available in CCGT and DCGT designations.

The combination of an innovative geometry, grade and coating composition has been proven to extend tool life from 30 to 60% depending upon the application. Added to this, the new MS6015 has confirmed improved component precision and insert tool life far exceeding the performance of alternate product lines.

For further details contact Multitrade Distributors on TEL: 011 87 803 2377 or visit www.multicarb.com



New ceramic grades for high temperature alloy machining — TaeguTec

The demand for cutting tools to increase productivity and cut the cost of machining high temperature alloys is always increasing, that is why TaeguTec has launched two new SiAlON ceramic grades — the TC3020 and TC3030 — that offer superior performance.

Both the TC3020 and TC3030 ceramic grades are suitable for high temperature alloy machining where difficult-to-cut materials such as Inconel, rene and titanium are used. These ceramic grades are characterised by their excellent toughness and anti-chipping capabilities making them the best choice for both interrupted and continuous machining.



With the introduction of both these grades, the Asian metalworking giant has gone a step further by supplying even more optimal solutions for machining high temperature alloys than its current whisker ceramic grade. The new grades are available for insert lines in turning, milling and grooving applications.

The TC3020 is ideal for high temperature alloy machining and runs in the same conditions as the whisker ceramic grade. Its superior wear resistance is due to its high stability while it offers better flank and notch wear resistance compared to the competitor's similar grade. Furthermore, the TC3020 has excellent high

Takisawa Taiwan shows its turn-mill strength at EMO 2017

Five machines were displayed by Takisawa Taiwan at EMO 2017, representing the company's extensive portfolio of slant bed horizontal lathes/turning centers, including the new MX-800 twin-spindle twin-turret turning center, plus two machines from the LA range and one from the FX series.

The new MX-800 twin-spindle twin-turret turning center is constructed on a horizontal box-type base to minimise thermal deviation, thus ensuring machining accuracy, as well as increasing the distance of the X, Y and Z axes' linear guideways to guarantee stability. The linear guideways also permit high-speed cycles to further boost productivity.

With twin facing T15 turrets and twin spindles, plus C axis for simultaneous second operation processes, the MX-800 will be ideal for multi-tasking operations in a single set-up.

The machine has twin 65mm bar capacity spindles and a maximum turning diameter, distance between centers and a turning length of 230, 1 100 and 250 mm, respectively. It can be supplied with a built-in robot or gantry, for integration into an automated system.

The FX800 CNC lathe is another true multi-tasking machine, with twin turrets and twin spindles plus C axis for simultaneous second operation processes in the same set-up. The machine has a 65mm bar capacity (52mm on the sub-spindle) and a maximum turning diameter, distance between centers and turning length of 260, 1 030 and



657mm, respectively.

With rapid traverse rates of 20m/min and a maximum spindle speed of 4 500 revs/min (5,000 revs/min on the sub-spindle), the 11kW model is billed as the ideal cost-effective turning center to suit a myriad of different workpieces.

Two turn-mill LA Series machines were also shown, including the twin-spindle LA-250YS. With Y and B axes, this has a maximum swing of 600mm, a distance between centers of 1 095 mm and a maximum turning diameter and length of 370mm and 737mm, respectively. With 3 500 revs/min available at both the main (15 kW) and sub (7.5 kW) spindles, 75mm bar can be accommodated.

Also on show was the the LA-350M L16 turn-mill center designed for heavy cutting, courtesy of a spindle equipped with a high/low two-step gearbox with high torque output, plus a large spin-

dle bore for 117mm diameter bar as standard and optionally 150mm. The T12 live servo turret with milling function is also equipped for heavy milling and drilling tasks.

The machine's meehanite bed casting, of slant design, represents an extremely rigid structure and together with heavy-duty box-way design promotes high machining accuracies. The machine design also allows ample space for chip flow and easy clearance of debris away from the machining process.

For more information contact F & H Machine Tools on TEL: 011 397 4050 or visit www.fhmt.co.za

temperature strength and fracture toughness.

The other new offering, the TC3030, is also created to handle high temperature alloys with the difference being that the grade's extreme toughness enables it more for higher feed and heavier depth of cut machining and is suitable for scaling and roughing applications while offering excellent thermal shock resistance and thermal conductivity.

By combining silicon nitride and aluminium oxide, TaeguTec's SiAlON grade offers chemical stability in order to reduce notch wear in demanding operations and has the capability to run at four to six times the speed of conventional carbide inserts. Product testing in real-world machining conditions demonstrated increases in productivity and tool life.

While performing a continuous grooving operation on an



engine casing made from Inconel 718, the TC3020 grade's productivity increased by 40 per cent over the competitor's similar ceramic grade, claims TaeguTec.

For an engine casing made from the same Inconel 718 with external interrupted turning and interrupted grooving operations,

TaeguTec's TC3030 increased tool life by 23 per cent and 56 per cent respectively, says TaeguTec.

The biggest improvement over the competition was on a rene 108 material, the TC3030 performed incredibly well on a face milling operation of a shroud workpiece when it increased tool life by

100 per cent, claims TaeguTec.

For more information contact TaeguTec SA on TEL: 011 362 1500 or visit www.taegutec.com

Integrated dressing with wire erosion — Studer-WireDress®

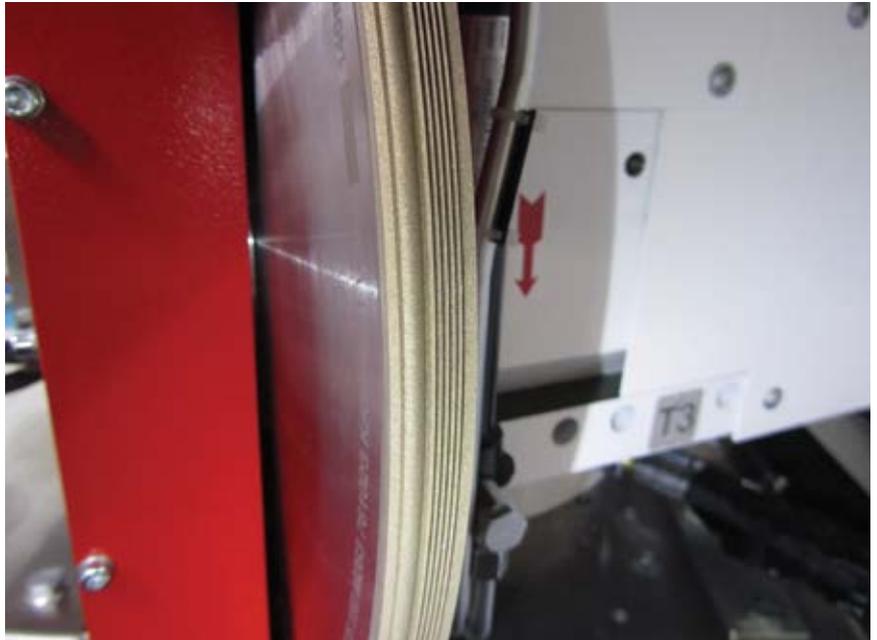
With Studer-WireDress® Fritz Studer AG brings a brand new dressing device to the market, which uses the wire erosion principle and is completely integrated into the grinding machine and its control system. The grinding wheel never has to be removed for dressing. Thanks to the high proportion of grain space, the wheel is very free cutting. This allows much more grinding oil to enter the grinding slot, enabling a high feed with less workpiece deflection. The dressing intervals can be longer. However, as the dressing process requires so little expense and effort, very complex contours can also be dressed at shorter intervals. As the user can fully utilise the advantages of metal-bonded grinding wheels during rough and fine grinding, the Studer-WireDress® dressing system pays for itself in less than a year.

The dressing device is a small wire erosion machine in principle. The electrode is a wire, which is drawn with a small gap tangentially past the machining point at a constant speed of 100 millimeters per second. The opposite pole is the grinding wheel, which moves at peripheral speeds of 50 to 140 metres per second during dressing. It does not need any dielectric, as the grinding oil used during grinding fulfills this function. The dressing wire is guided in a groove on the circumference of a thin, circular ceramic disk. The ceramic disk has a notch at the point where the sparks jump between the wire and the grinding wheel.

Feeds of 15 to 25mm/min can be achieved when dressing a typical metal bond. In this way largely free geometries and intricate contours with internal radii of 0.2mm and external radii of 0.05mm are generated on the grinding wheel. Removal rates of up to 80mm³/min are achieved. The grain retains its original shape during this contactless dressing process.

No wear on the dressing tool

As the wire is continuously advanced during the dressing



process, an electrode with precise geometry is always located at the dressing position.

The wire reel in the dressing unit contains ten kilometers of wire; this supply would allow dressing to be continued for approximately 16 hours without interruption. The used wire is cut into short pieces immediately after the dressing process and collected in a container. The ceramic guide disk across which the electrode wire runs is extremely resistant and only wears after several hundred hours. The circumference of the disk has three of the abovementioned notches; if necessary it is simply turned further round by one of the three segments and an intact wire guide is available again.

Control unit integrated into the grinding machine control system

The STuder-WireDress® control unit is integrated into the control system of the grinding machine. It has all necessary dressing functionalities and also contains a software programme for intelligent profiling with path optimization (StuderDress integrated). The grinder does not need any special training to operate the dressing device, as he is guided by the clear and transparent guidelines on the screen of the control unit.

The new development also brings significant energy savings as part of the Blue Competence measures at Studer. It only needs around 500 watts during dressing, and just 25 watts during the standby phases. For comparison rotary dressing with diamond wheels uses 1.5 kilowatts and the energy required for the provision of sealing air, which is constantly necessary, is 1kW.

For more information contact Retecon Machine Tools on TEL: 011 976 8600 or visit www.retecon.co.za



Widia's solid carbide Top Drill S 45x

Offers speed, tool life, and extreme value in stainless steels and superalloys.

Users of Widia's TDS-series drilling solution are already familiar with its performance in steel, cast iron, and non-ferrous alloys. Now those shops that routinely drill stainless steel and superalloys can enjoy its benefits as well, with a new drill that takes proven holemaking technology and kicks it one step further. It's called TDS45x, and it's going to drastically improve how aerospace, medical, oil and gas, and other manufacturing operators that make holes in tough materials.

The TDS line was already designed for customers facing difficult cutting conditions. Inclined exits and entries, unstable setups, intersecting holes are just a few examples where TDS shines. As a result, TDS offers the lowest cost per part and highest metal removal rate in its class. Further, the series is often the platform of choice for make-to-order and custom drilling solutions.

Those attributes and more are also found in TDS45x, except that the new series drill is designed specifically for high-temperature alloys and austenitic stainless steel.

Thanks to an improved gash design that uses a continuously increasing rake angle together with optimised coolant holes and straight cutting edges, TDS45x offers excellent tool life in even the most challenging materials.

Its double margins increase the tool's stability, while the highly polished flute and steep core, smaller cross-section reduces friction. This provides drastically improved chip evacuation and more predictable processes.

The patented TDS point means there's no need for a pilot hole; speeds and feeds can be increased while cutting forces are reduced. TDS45x also uses a fine-grained carbide substrate

for greater toughness and less risk of fracture. And an h6 high-precision shank makes it suitable for shrink-fit toolholders, resulting in better hole quality, up to IT8 is possible in some cases.

If you're wondering what the "X" stand for, it indicates flute length, with TDS451 at 3xD, TDS452 at 5xD, and TDS453 at 8xD length to diameter ratios. All are available in diameters ranging from 3.0 to 20.0mm and all have through the tool coolant, a 140° point geometry, and a proprietary PVD AlTiN coating.

The coating is a large part of TDS45's success. Widia's WM15PD provides extreme hardness even under the elevated cutting temperatures common with high-strength chromium-nickel alloys. Couple that with a new post-coat treatment and flute polishing, and tool life is improved by an average of 10 to 30 per cent, says Widia.

The TDS45 can be re-sharpened as well. Up to five regrinds are recommended, although further sharpenings are possible if some small amount of flute wear is acceptable. Considering its greater tool life and wear resistance, reduced cutting forces, maximised feedrate and spindle speeds, and improved hole accuracy (without a pilot hole), TDS45x is sure to find a preferred spot in the tool crib of anyone facing the challenges of stainless steel and superalloy holemaking.

For more information contact Widatech on TEL: 011 450 2108, email: info@widatech.co.za or visit www.widia.com



Hypertherm expands availability of FlushCut consumables to more Powermax air plasma systems

Hypertherm, a manufacturer of industrial cutting systems and software, has introduced the availability of FlushCut consumables for more Powermax plasma systems. These new consumables are designed to work at 45 amps on Powermax45 XP, 65, 85, and 105 systems. In addition, owners of the original Powermax45 can use the consumables provided they upgrade to a Hypertherm Duramax series torch. Previously, FlushCut consumables were only recommended for use on Powermax105 and Powermax125 systems.

Hypertherm's FlushCut consumables feature an angled nozzle bore that delivers the plasma arc at a 45-degree angle. Instead of locating the nozzle opening at the tip as is typically done, the FlushCut nozzle orifice is located on the side. This essentially bends the plasma arc, causing it to exit the torch at an angle nearly parallel to the workpiece. As a result, Powermax users can cut closer, or more flush, to the base metal than ever before. This in turn dramatically reduces the amount of material left behind and significantly reduces grinding time.



Customers using the process report they are completing jobs about 60 per cent faster. Another benefit is the ability to reuse the attachments that were removed. Operators can also use the process instead of a grinder, at lower amperages, to wash away residual material or hard facing without damage to the metal.

The new 45-amp flush cutting process is capable of safely removing attachments, fixtures, and other protruding features that are between 12mm and 25mm in thickness. The process is helpful for any job that requires the separation of two metals. Lugs, temporary weld supports, and pad eyes can all be removed without damaging the base material holding the piece in place. In addition, the flush cutting process simplifies the cutting of weld access holes in I-beams, and also makes it easier to remove bolts or other parts from metal plate. For more information please visit www.hypertherm.com/FlushCut.

For more information contact Craig Sterly of Hypertherm on email craig.sterly@hypertherm.com or visit www.hypertherm.com

New tool holders offer firm grip on progress — Sandvik Coromant

PrimeTurning™ now accessible on multi-task machines and VTLs.

Cutting tool and tooling system specialist Sandvik Coromant has unveiled a new range of CoroTurn® Prime multi-task and axial type tool holders to help machine shops implement the new PrimeTurning™ methodology, which enables turning in all directions. The introductions allow users to maximise the benefits of PrimeTurning on multi-task turn-mill centers and vertical turning lathes (VTLs). Complementing the company's existing radial tool holders, Sandvik Coromant now has a complete offer for PrimeTurning operations.

One of the highlights of the range is the CoroTurn Prime Twin tool holder for multi-task machines. Both CoroTurn Prime A and B-type inserts can be mounted together on Twin tool holders, allowing manufacturers to undertake roughing with a B-type insert before switching to finishing with an A-type insert, for example.

"Modern multi-task machines are intended for the complete machining of components but typically have a slow tool changing time, often around 15-20 seconds," says Håkan Ericksson, Product Manager General Turning at Sandvik Coromant.

"As a result, the new Twin holder will save customers a considerable amount of time when changing tools."

As a further advantage, B-axis machining on multi-task machines permits the operator to programme the angle of the tool in precise increments. When the machine cuts using its B-axis, a lot of accessibility is created using neutral holders. In combination with streamlined operations, this delivers the potential for huge time saving and productivity increases to help manufacturers reduce tooling inventories and achieve competitive gains.

Six new multi-task tool holders are being introduced, which are mounted at a 45° angle for B-axis machining and can be used with either CoroTurn Prime A-type or B-type inserts. Options for multi-task machines include four tool holders (one-insert only) and two Twin tool holders (two inserts). The CoroTurn Prime Twin tool holder is available for use with Coromant Capto® C5 — C8 size.

A range of axial tool holders for vertical turning lathes is also part of the range, which means that Sandvik Coromant now has a complete offer for PrimeTurning: Axial, radial and multi-task tool holders. In total, eight dedicated tool holders for

axial mounting are being launched. This type of tool holder is compatible with most types of vertical lathes, and is available in Coromant Capto for use with either CoroTurn Prime

A-type or B-type inserts.

Although PrimeTurning is applicable to the entire general turning area, machine shops with large batch sizes (automotive) are set to benefit most, as will those machining large components (aerospace), where there is a need to reduce tool changes, set-up time and production stops.

Ultimately, the all-directional PrimeTurning method and CoroTurn Prime tools will ensure that manufacturers can complete their turning operations in a much more efficient way. Compared with conventional turning, a 50-80% increase in productivity, along with 1.5 to 2 times more tool life, can be achieved.

Hein Nel appointed as new Sales Manager

Sandvik Coromant have announced the appointment of Hein Nel as its new Sales Manager with immediate effect. Hein will be responsible for contributing to Sandvik Coromant's overall strategy and increasing offerings to both existing and new customers. Hein will oversee marketing, strategic business partnerships and sales in South Africa and Sub-Saharan.

Born in South Africa, Hein holds various industry and management qualifications and has more than 24 years' experience in the manufacturing industry. He has previously had management roles in sales, design, production and training. His last role saw him responsible for various projects for the pump and valve industry, railway as well as the manufacturing of munitions.

Hein commented: "I look forward to expanding Sandvik Coromant's business locally and look forward to helping customers on their digitalisation journey."

For further details contact Sandvik Coromant on TEL: 0860 101 008 or Mary-Ann Haylett on TEL: 011 570 9615, or email: mary-ann.haylett@sandvik.com or visit www.sandvik.coromant.com



Sandvik Coromant's new Sales Manager Hein Nel



TC3020 & TC3030

TC3020

TC3030



>>> NEW CERAMIC GRADES FOR HIGH TEMPERATURE ALLOY MACHINING

- Ideal for high temperature alloy machining and runs in the same conditions as the whisker ceramic grade
- Superior wear resistance due to high chemical stability





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