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The Thermal Ceramics business of Morgan Advanced Materials makes a range of fibre and refractory high temperature insulation products used to reduce energy consumption in industrial processes. Its products are also used in passive fire protection applications.

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The Thermal Ceramics business produces a variety of market leading brands including; Superwool® low bio-persistent insulating fibre, Pyro-Bloc® modules, Min-K®, WDS® and BTU-BLOCK™, microporous and JM™, K® and TJM™ Insulating Firebricks (IFBs).

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South Africa
cover story
Spectro introduces Spectrolab S – A high-end OES analyser for process control and research metal analysis

industry news
McWade Productions continues on its growth path; AMSA’S 2 000 job cuts and the ongoing steel industry woes are self-inflicted; Metso looks to close Isithebe foundry; Insimbi moves further into scrap metal recycling; Breaking the mould with robotic sand milling to generate patternless castings; Amsted Rail announces name change for South African operation; SAIF’s 56th Annual Awards Dinner; Ford’s expansion unleashes new potential for South Africa

international news
Important developments emerge from GIFA/GMTN 2019; MHI and Primetals Technologies to acquire ABP Induction Systems; Sinto forms Joint Venture Company in Turkey

product review
Metkon spectrographic sample preparation equipment; ASK Chemicals presents its solutions for 3D sand printing; Altair Inspire Cast: Streamlined casting simulation software inspires you to avoid defects
Don’t risk getting stuck in the ‘Iron Age’

WOW!! Is how one exhibitor described this year’s GIFA/GMTN 2019 exhibition and I could not agree more. The adage that it would be more or less of the same as the previous exhibition held in 2015 was dispelled within the first hour of walking the halls in the GIFA section. Then in our first press conference we were hit with the statement: ‘Maturity of conventional technologies – the potential to optimise Die Casting is more or less exhausted’. This was a statement by Jonathan Abbis, Managing Director at Bühler Die Casting in his presentation to the media.

Once analysing this statement you cannot take it in its isolation but have to take it in the broader context of what Abbis was presenting about the future of die-casting and the technology that will be associated with die-cast manufacturing. With what we observed on the various stands at the exhibition and the associated talk around the implementation of the new ‘digital’ technologies in manufacturing, Abbis was not wrong. More importantly this statement does not just apply to die-casting, it will apply to most manufacturing situations. Read about this development and others in the report on GIFA/GMTN 2019 further on in the magazine. Adopt or adapt to the new digital age technologies or you risk getting stuck in the ‘Iron Age’.

This year, a separate workshop on the metallurgy market in Africa was held for the first time within the framework of METEC. It was initiated and organised by africon, an independent German consulting company with its sole focus on sub-Saharan Africa, in close cooperation with Messe Düsseldorf and the VDMA (The Mechanical Engineering Industry Association in Germany). Representatives from various African countries and companies in the industry gave insight into the challenges and opportunities of the African metallurgical market in presentations and panel discussions.

The first session focused on the needs and expectations of German/international metals production, metals processing and metallurgical machinery sectors when looking into doing businesses in Africa (e.g. technology, education & training, competition).

The second session focused on what the African markets can offer to and need from German/international metallurgy, steel casting and metal companies willing to start business in Africa (e.g. market potential, financing, local support).

There is a report being compiled on the proceedings and hopefully we will be able to publish it in the future. However, the belief that South Africa is the only country on the African continent that the rest of the world focuses on must be dismissed. Representatives from Nigeria, Tanzania, Ethiopia and Kenya were all invited to give presentations at the workshop. A great pity we did not have the time to attend the workshop but we eagerly await the report.

Another development through the VDMA is their Open Platform Communications Unified Architecture (OPC UA) initiative, which is an open interface standard that defines the mechanisms of cooperation in the industrial environment. It enables the industry to integrate its products and its production by information and communications technologies (ICT). In future machines and factories can be redesigned as required by plug and work, irrespective of which manufacturers the machines and components originate from.

Another noticeable change and mostly revealed at the exhibition was the number of supplier cooperation agreements that have been put in place.

This was one of the most exciting GIFA/GMTN’s that I have attended – my seventh – and as expressed by other South African visitors there have been quantum leaps taken forward in the foundry industry and GIFA has exposed us to the start of the process of the ‘future of the modern casting’ process.

South African Institute of Foundrymen

The aim of the SAIF is to promote and develop within Southern Africa the science, technology and application of founding for individuals and involved industries.

Council Appointments for 2019

Chairperson – Glen Dikgale
Deputy Chairperson – Janley Kotze
Treasurer – Vacant
Other Directors – Enno Krueger, Nigel Pardoe and Didier Nyembwe
Elected Members – Kevin van Niekerk, Andrew McFarlane, John Taylor, Murray Speed, Nigel Brains

Address Details
University of Johannesburg Metal Casting Technology Station — Metallurgy; Room G101, John Orr Building, Corner Siemert and Beit Street, Doornfontein, Johannesburg, Gauteng.

Postal Address:
P.O. Box 14863, Wadeville, 1422.
Website: www.foundries.org.za

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Tel: +27 (11) 559 6455;
Fax: +27 (11) 559 6526;
email: mbiljon@uj.ac.za

Western Cape:
Phewe Nene
Cell: 072 606 0913;
email: phiwe@live.com

Dates for future SAIF activities
14 November 2019 - SAIF Annual Golf Day for SAIF Members
Reading Country Club, Fore Street Alberante, Alberton
09:00 am – 20:00 pm
Take hold!

HÜTENES-ALBERTUS conducts intensive research to combine the special foundry chemistry knowledge acquired over many decades, with completely new approaches. Our international specialists work hand in hand with the foundries to create the most economical and environmentally friendly casting processes. Our team is at your service.

SI Group
The Substance Inside

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Spectro Analytical Instruments has introduced the Spectrolab S high-performance arc/spark optical emission spectrometry (OES) analyser for the analysis of metal in process control and research applications. The analyser represents a real revolution in high-end OES metal analysis featuring Spectro’s proprietary CMOS+T technology while delivering the fastest measurements, lowest limits of detection, longest uptime, and most future-proof flexibility in its class, says Spectro.

Many users of high-end stationary metal analysers are tasked with identifying and measuring all the elements and compounds in their incoming, in-production, and outgoing materials with exceptionally high accuracy and precision. This may also include research on new materials. The new Spectrolab S is designed to be the best-performing spectrometer available for primary metal producers as well as a solution for secondary metal producers, automotive and aerospace manufacturers of finished and semi-finished goods including electronics, semiconductors, and other end user products.

In terms of sample throughput, Spectrolab S meets the metal market’s need for ultra-high-speed measurement. For
example when analysing low alloy steel, it can deliver highly accurate measurements in less than 20 seconds.

The Spectrolab S has the world’s first CMOS-based detector system that’s perfected for high-end metal analysis thanks to Spectro’s proprietary CMOS+T technology. From trace elements to multi-matrix applications, it provides high-speed, highly accurate analysis plus the lowest limits of detection in its class, limits previously attainable only with PMT detectors. On some key elements, Spectrolab S CMOS+T technology surpasses PMT performance.

Uptime is outstanding says Spectro as the Spectrolab’s regular maintenance intervention requirements (spark stand cleaning) have been reduced by a factor of eight. Calibration is easy and cost-efficient needing only a single-sample, five-minute standardisation. In most cases, unique iCAL 2.0 diagnostics ensure stable performance from then on regardless of most shifts in ambient temperature or pressure. Most users save at least 30 minutes a day.

The analyser’s flexibility ensures that it is future proof. New elements or matrices can be added via a simple software update eliminating the need for substantial hardware modifications.

Spectro’s familiar, intuitive user interface ensures effortless ease-of-use, even for less experienced personnel. Instead of multiple dialogue boxes, a simplified operator view presents clear choices via dedicated toolbar buttons. Tailored application profiles eliminate complicated method development.

The Spectrolab S provides both short-term and long-term stability. Unlike conventional analysers, its sealed, no-purge optical system maximises light transmission stability, even in the far UV. Its software utilises sophisticated measures such as online drift correction and iCAL 2.0 temperature compensation for reproducible readings, even over successive shifts or maintenance intervals.

To fit packed laboratory spaces, the Spectrolab S features a 27% decrease in footprint over previous models. Conveniences include an easy-reach start/stop button and fixed function keys, a spark indicator light, noise minimisation construction and quick, tool-free access for spark cleaning or air filter changes without opening the main instrument housing.

Spectro helps ensure uninterrupted performance and maximum ROI life by offering Amecare services. Machine-to-machine (M2M) support allows proactive alerts, backed up by an on-request PC connection with a remote Spectro service expert.

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In terms of sample throughput, Spectrolab S meets the metal market’s need for ultra-high-speed measurement. For example when analysing low alloy steel, it can deliver highly accurate measurements in less than 20 seconds.

The new Spectrolab S high-performance OES analyser for the analysis of metal in process control and research applications is available immediately.

For further details contact Spectro Analytical South Africa on TEL: 011 979 4241 or visit www.spectro.com
South Africa's first ‘Factory of the Year’ award has been presented to Eberspächer South Africa based on an assessment of customer satisfaction, product quality, value creation, economics, agility and innovation.

Judges said Eberspächer, which manufactures exhaust systems, was a highly efficient producer with a balanced score across all dimensions, falling within the top quintile of global benchmarks in terms of quality. Its advanced use of robotics and automation had brought about efficiency gains for the factory in recent years, they added.

‘Factory of the Year’ is a global annual competition that has been running for over 25 years and is recognised as the toughest benchmarking test for companies in the production arena. It draws on best practices from over 2 000 factories across all industries and over 30 countries.

The initiative was launched in South Africa in 2018 by A.T. Kearney in partnership with the department of trade and industry, Council for Scientific and Industrial Research, Manufacturing Circle and Manufacturing Indaba.

Columbus Stainless received an excellence award in large scale production. The excellence in digitisation award was given to Atlantis Foundries while Nampak won honours for excellence in resource efficiency.

Atlantis Foundries produces automotive castings (In-line block castings) for the commercial vehicle industry. In addition, Atlantis Foundries operate a full machining facility. The plant is situated in Atlantis, Western Cape, approximately 50km north of Cape Town.

“The current dynamics of the globalising world presents a challenge for all manufacturing operations, and specifically within the South African manufacturing environment where a strong sector has immense downstream impact,” said Igor Hulak, a partner at A.T. Kearney.

“More than ever, companies have to find the right balance in their manufacturing footprint and global value chain design. To successfully sustain and grow production, achieving and maintaining world-class excellence requires every manufacturer to relentlessly and continually pursue efficiency improvements,” said Hulak.

He noted that nowadays even that was not enough, with the advent of the fourth industrial revolution meaning the local manufacturing community could no longer shy away from the pace of adoption of related technologies on shop floors, which had been dramatically increasing over the past three years.

“Though the South African sector in general has a relatively wide performance gap to close, we have been very pleased to see that the top awardees in this country can withstand direct comparison with world class performance and standards on the evaluated dimensions,” added Hulak.
The new Trade and Industry and Economic Development Minister Ebrahim Patel has promised to launch a support programme for new plant and equipment, specifically mentioning the development of foundries and steel mills. The promise came during his first budget speech to the National Assembly as the new minister.

“The President announced in SONA that we will develop a number of Master Plans to help create conducive conditions for industries to grow. This will include assisting companies to improve their industrial capacities and sophistication, focusing more on export orientation, and reclaiming domestic market space lost to imports. A key constraint to growth is electricity pricing. We are working with Ministers Mantashe and Gordhan to lower the cost structure of Eskom for more affordable electricity tariffs, particularly for priority sectors, which need to be boosted to create jobs and inclusion. The Master Plans will be action-oriented, implemented through working with business and labour and implemented in stages, so that we can move immediately,” said Patel.

“In the steel industry, we will this year launch a support programme for new plant and equipment in metal fabrication. We are meeting investors on the development of foundries and steel mini-mills, including measures to enable beneficiation of scrap metal. We will make the R1.5 billion Steel Industry Competitiveness Fund more attractive and easier to use,” Patel continued.

The Downstream Steel Industry Competitiveness Fund, administrated by the IDC, became effective on 7 June 2017, and was established to support domestic metals manufacturers facing import competition. It was also seen as a way of partially offsetting the effect of government’s decision to raise tariff protection on primary steel products produced by ArcelorMittal South Africa.

The incentive is available to existing downstream steel manufacturers seeking to improve their competitiveness, as well as those companies in distress with bankable turnaround strategies. Start-up enterprises and early-stage technologies and prototypes are also considered on a case-by-case basis.

The fund was created using a R95 million grant from the Economic Development Department, which was to be disbursed to the IDC, in three tranches, from 2017/18 to 2019/20.

The development finance institution is using the grant to leverage a larger R1.5 billion incentive that is extended to eligible beneficiaries as a subsidy against IDC’s normal interest rates.

Scrap beneficiation

No details were given of the plan for scrap beneficiation. In June 2019 it was gazetted that the Price Preference System had been extended. South Africa exports significant quantities of scrap metal, a major feedstock for foundries, steel mini-mills and even some large steel mills, with some scrap dealers appealing the department’s directive that it be offered to local producers in the first instance, but the Constitutional Court rejected an application for leave to appeal.

Steps taken to improve domestic scrap availability have, over the years, been broadly supported by scrap consuming industries, but resisted by scrap metal recyclers.
Nine years ago, McWade Productions decided to take stock of its foundry facility in Olifantsfontein, Gauteng and have a hard look at its operational and manufacturing procedures and equipment with a view to improving productivity, yields and increasing capacity.

“The biggest drawback in the foundry was how its layout and workflow had evolved over the years. You could say it was thrown together, since the company was established in 1961 as a supplier to the electrical power transmission industry in Southern Africa and because of production demands the overhaul of the foundry was always put on hold. This was until we took a strategic decision to increase our production levels and diversify into forging,” said Terence Stopforth, McWade’s recently appointed Operations Manager.

Recent acquisition of Babcock Ntuthuko Powerlines introduces forging into its service offerings.

“McWade Productions continues on its growth path and diversifies outside of just being a foundry.”

Operations Manager Terence Stopforth and MD Marc Hindle
Robotic Sand Milling

Patternless sand mould production at 25% of the cost of 3D printing with double the speed!

The RSM package shares a lot of the same benefits as other patternless moulding methods when compared to traditional pattern-based moulding.

**BENEFITS**

- More flexibility/less limitations with geometry
- No requirement for tapered sides
- Can easily mill undercuts
- Can quickly adapt to design changes
- CAD/CAM based programming means modifications to mould design can be implemented immediately
- Moulds can be easily customised/switched for different variations
- Moulds can be re-machined/milled multiple times
- Fully automated operation
- Setup and let it run overnight

**SPECIFICATIONS**

- Mould size up to 4 x 2 x 1m
- 6-Axis Robot
- High Performance Spindle
- Proprietary PLC Controls
- Auto Tool Change
- Auto Tool Inspection
- Complete Cell System
- Ideal for prototypes and short runs

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as well as actively seek outside work,” said Marc Hindle, Managing Director of McWade Productions. “We decided to get in an outside consultant who, in conjunction with ourselves, could look at a new layout. It is always good to get an independent view, no matter who it is, because to quote an old cliché, you sometimes operate with tunnel vision,” continued Hindle. “Shortly after we had appointed the consultant there were a number of benchmarking exercises offered to the foundry industry and we took part in all of them. The results from these benchmarking exercises certainly highlighted our highly non-productive situation.” “With all this information we could devise a plan to take the foundry forward into a situation where we would start to see real benefits on the production side as well as to the bottom line.” “The foundry side of the business had been growing steadily compared to the other units in the company, which had seen relatively rapid growth and had formed a much bigger percentage of our annual turnover,” continued Hindle. “However, the foundry is an integral operation within the company, especially when you look at the number of proprietary products that the company markets, and the foundry supplies castings to make up these products.” The transition of the aluminium sand and gravity die-casting production foundry required a change of layout. Pit furnaces had to be scrapped and were replaced with tilting furnaces and their positioning in the foundry was in such a way that it was more conducive to the flow of the foundry. Gas fired burners were acquired to improve the quality of the metal melt and reduce scrap. The sand plant, including reclamation equipment, was relocated and the procurement of a shakeout and knockout plant took place, as well as the addition of a continuous sand mixer. At the same time the company introduced a number of roller tracks and an overhead rail track and put them in place so that they fitted in with the new design, so as to reduce bottlenecks and wasted downtime. The benefit of investing in new equipment, procedures and systems was immediate. McWade Productions was able to double capacity and reduce scrap substantially as soon as the changes had been implemented and completed. Whereas before its monthly average was 15 tons of castings per month, it now casts between 32 and 40 tons per month depending on the product mix. McWade Productions has continued to invest in its foundry operations and people since its first phase of upgrading was completed in 2012. “If you want to stay ahead you always have to look at new opportunities and question existing processes, practices, systems and methods,” said Terence Stopforth, McWade’s recently appointed Operations Manager. “The company manufactures castings for electrical components using die casting and sand casting processes. The metal used is aluminium bronze, copper and steel. Aluminium 6 (LM6) has a high resistance to corrosion under both ordinary atmospheric and marine conditions, and has McCWade Productions has been diversifying its product mix in the foundry. They have reduced their reliance on the high voltage electrical transmission and distribution industry. At one stage this industry accounted for 80% of the turnover but now it only accounts for 12%. McWade Productions now manufactures products such as fan blades for mining clients McCWade Productions is a leading supplier and manufacturer of high voltage electrical transmission and distribution products in Africa for sub stations and line projects McCWade Productions’ product range includes clamps, isolators, connectors, crimping tools, compression joints, compression hardware, insulators, line fittings, switch gear, distribution hardware and many others
excellent castability. Its ductility enables castings to be rectified easily or even modified in shape. For example, simple components may be cast straight and later bent to the required shape. The type of sand used for sand casting is silica sand,” explained Stopforth.

McWade Productions is a leading supplier and manufacturer of high voltage electrical transmission and distribution products in Africa for sub stations and line projects. Its product range includes clamps, isolators, connectors, crimping tools, compression joints, compression hardware, insulators, line fittings, switch gear, distribution hardware and many others. Currently it has over 6 000 stock codes in its system and many of these codes will have multiple components listed within the code.

“The latest equipment investment was in a 3D printer. Prior to that we had installed two more 250 kilogram electrical resistant furnaces, a 5-litre core shooter, a gassing unit, a Bruker Q2 spark spectrometer so that we can formulate our own alloys, a drying unit and then we completely overhauled our air supply system, which has led to significant savings in electrical costs.”

“You might think that this is not a huge amount of investment in the foundry over this period but you have to take into account that we are not just a foundry. The philosophy of McWade Productions is to manufacture as many of the components that are used to assemble our products, as well as invest in the related technology and processes associated with manufacturing them. This includes tooling, machining, welding and fabrication.”

Pit furnaces had to be scrapped and were replaced with tilting furnaces and their positioning in the foundry was in such a way that it was more conducive to the flow of the foundry.

“LIL was founded in 2006. Our mission is to supply consumers with primary non-ferrous products, ferro alloys and other raw materials consumed by the foundry industry. LIL supplies over 40 products to a multitude of industries, primarily in South Africa but also in the neighbouring countries. We pride ourselves with keeping stock at all times, as well as efficient and reliable deliveries. LIL is also ISO-9001 certified.”
Toolroom

“For example in our foundry facility we have invested in CNC equipment and we now have a fully-fledged toolroom servicing the mould and die requirements of the foundry. This includes maintaining existing moulds and dies as well as manufacturing new ones when our design department comes up with a new design. The 3D printer enables us to create one-off prototypes without having to face the costs associated with traditional mould making. Creating casting tools can be incredibly expensive. This means that for small and medium production runs, high tooling costs often cannot easily be amortised.”

“Metal casting may be one of the oldest manufacturing methods used to create metal parts, but it is also yet another sector that can benefit from 3D printing. With the high costs involved in producing tooling aids like moulds, cores and patterns, 3D printing is already proving to be a worthwhile alternative to the conventional production of tooling for metal casting processes. Foundries are therefore increasingly adopting 3D printing into their workflows as a means of remaining competitive,” added Stopforth.

Training

“We are also big on training and have adopted the NTIP student training initiative from its inception. On average we will train 13 students a year and we make sure that they are exposed to all areas of the foundry, the toolroom, machining, fabrication and assembly.”

“Our foreman in the toolroom is a product of this initiative. We could see that he had the ability and ambition to further himself and after being with us for three years as a student we took him on as a permanent staff member. His knowledge of CNC machines and the Edgecam machining programme that we use is very impressive,” said Stopforth.

Diversification

Picking up the story Hindle explained: “For the majority of its history McWade Productions has concentrated on manufacturing and supplying product for the high voltage electrical transmission and distribution industry. One of our biggest clients is the SOE Eskom and it still remains so. However, through diversification of product mix in the foundry we have reduced our reliance on this industry. At one stage it accounted for 80% of our turnover but now it only accounts for 12%.”

“We have done this in a number of ways. About six years ago we absorbed another aluminium foundry into our business. This immediately added a whole host of components for the catering industry to the mix. We also actively pursued opportunities in the rail, food, agriculture and mining industries,” said Hindle.

“We now cast components, all in aluminium, such as...”
bailer needles, fan blades, shafts for compaction units, swing trays for the aluminium smelters, meat saws, potato peelers, jaffle makers, plates for grillers and one of the more bizarre ones – components for the lowering mechanisms used in the burial industry.”

“We have also acquired various companies that manufactured similar or complementary components. These included Burcon Engineering, B Karg Engineering, Elbroc, CCL, Linegear 2000, Zodiac Engineering, Idube Electrical, Heron Engineering and Trugrid Sales.”

“The acquisition of these companies has not only diversified our product range but also allowed us to manufacture components that we used to outsource. It has also diversified the materials that we beneficiate. For example, Trugrid Sales have for over 30 years designed and manufactured fiberglass structures and access systems, which are also part of the mix of products and components for the high voltage electrical transmission and distribution industry. Their products can also be found in many other industries as well.”

Acquisition of Babcock Ntuthuko Powerlines

“Our most recent investment has been the acquisition of Babcock Ntuthuko Powerlines.”

“Building ‘highways’ for power is the core of the business that has been established since 1954 and occupies a 39 000m² under-roof facility in Nigel, Gauteng, with a further 18 700m² under-crane externally at its disposal.”

“The business is a large manufacturer of transmission and distribution line hardware and forgings and includes manufacturing and testing.”

“Installed capacity is up to 120 tons per month of forged components for both powerline line hardware and third-party requirements in the mining, railway, automotive, marine and forestry sectors. McWade Productions requires a number of forged components for its products, so the new company – McWade Powerlines – will be able to supply these.”

“The company is very well equipped with the latest equipment for servicing the forging industry and providing the value-add services such as machining, toolroom, heat treatment and design.”

“Production equipment in the forge includes four banning pneumatic hammers with forces of 2000, 3500, 4000 and 6000 kg/m, including induction heating furnaces and trimming presses, one 250 ton horizontal forging machine, induction and gas fired heating furnaces, two shot blasting machines and fully automatic cold saws, a high volume billet cropper, two bench type MPI machines for crack detection, numerous eccentric and fly presses used for coining or manufacturing of forged bolts, nuts, U-bolts and other components, various metal finishing and deburring machines and three 620 CFM screw compressors with receivers.”

McWade Productions is a leading supplier and manufacturer of high voltage electrical transmission and distribution products in Africa for sub stations and line projects

Larger castings are machined in the machine shop

McWade Productions likes to control the whole manufacturing process from foundry to assembly. The company now casts between 32 and 40 tons of aluminium castings a month depending on the product mix
"The company also has a toolroom and machining facility that includes a Haas VF3 CNC that has a table load of up to 1 500kg, two rigid copy milling machines, two AgieCharmillies spark erosion machines, five milling machines, two surface grinders, one cylindrical grinding machine, four lathes, one precision drill, a cold saw, a pantograph, a metallurgical laboratory with routine hardness and tensile testing equipment and five heat treatment furnaces."

"The company has a long history of dealing with Eskom and has recently been involved with integrating the Medupi and Kusile power stations into the national grid."

**History**

McWade Productions is part of the Royal Bafokeng Group. Royal Bafokeng Holdings (RBH) is a community-based investment company whose growth uplifts and creates intergenerational wealth for the Royal Bafokeng Nation (RBN), a 100 000 strong Setswana-speaking community in South Africa’s North West province. McWade Productions falls under the Mining, Oil and Gas Services subsidiary of RBH.

Founded in 1961, McWade Productions has progressed in line with the growth of the electrical transmission industry in Southern Africa and is today a prime supplier of electrical components and accessory equipment to the African and international transmission and distribution electrical industry.

The company was family owned until the 1970s before being sold to the then Cullinan Group. The late Basil Burnett, a director at the Cullinan Group responsible for the operations at McWade Productions and father-in-law of current Managing Director Marc Hindle, decided to purchase the company in 1976.

The company was sold to the Bateman Group in 1988 before a management buyout took place in 2005. Hindle, a Mechanical Engineer, has been with the company since 1981 and his partner, Sales and Marketing Director Dessen Naidoo, joined the company in 1978.

Combined, both directors have a majority shareholding in the business having sold a sizeable percentage of the company to a division of the Royal Bafokeng Holding Company in 2008.

Babcock Ntuthuko Powerlines was a subsidiary of Babcock International Group Plc until the recent transaction.

**Local designation**

"With local designation starting to gain momentum at many of the SOEs it is important that you are able to manufacture as many of the designated products as well as be compliant. We have invested so that what we were previously sourcing from Taiwan is now made locally and we have achieved a Level 1 approved B-BBEE status, as well as being ISO 9001:2015 accredited."

For further details contact McWade Productions on TEL: 011 316 2262 or visit www.mcwadeproductions.co.za
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Thermal Fabricators
The National Employers’ Association of South Africa (NEASA) says the potential loss of 2 000 jobs at Arcelor Mittal South Africa (AMSA) will have a massive effect on the current unemployment rate in the country. Recently AMSA said it was mulling a large-scale restructuring exercise, which might affect more than 2 000 jobs, citing a difficult economic environment. The National Union of Metalworkers of South Africa (Numsa) also confirmed that it had received a notice from the multinational steel manufacturing company about a restructuring exercise.

“The matter is receiving much media attention and justifiably so; every job lost has a huge adverse effect on the individual, even more so in the current declining job market. Losing one’s job places any individual in a desperate dilemma,” said NEASA Chief Executive, Gerhard Papenfus.

Papenfus said the steel industry’s loss of 100 000 jobs during the last decade and hundreds of thousands of jobs over two to three decades, did not get sufficient attention.

“One of the main culprits is South Africa’s bargaining council dispensation (which in the steel industry culminates in the Metal and Engineering Industry Bargaining Council (MEIBC)), which unashamedly discriminates against SMMEs especially with regard to conditions of employment. The provisions in the Labour Relations Act, which establishes the framework for this SMME-hostile/job destroying dispensation, confirm the fact that there is neither the political appreciation nor political desire to create a dispensation in which SMMEs can flourish, which is a prerequisite for igniting industrialisation.”

“The unvalued SMMEs are AMSA’s customers. As they decline, so does AMSA’s market.”

“In 2015, under this severe economic situation, AMSA turned against its own customer base. That is when government made a 180-degree about-turn (after a visit by the owner of AMSA International to former President Zuma) and introduced a 10% customs duty, followed by a further 12% safeguard duty, to protect AMSA against the import of cheaper, better quality steel. The impact on the downstream

“It needs to be kept in mind that the duties protect a foreign owned 70-year-old steel mill. With its antiquated production methods and electricity burden, which is 60% higher than that of a modern steel mill, it cannot compete with global competitors, both in terms of price and the quality of steel. The steel downstream and the South African consumer carry the brunt.”

“The result of de-industrialisation policies was not as spectacular as the loss of 2 000 jobs in one workplace, but much more devastating. The gradual effect of the slow poison, which systematically wrenched the life out of South Africa’s SMME’s, simply wasn’t newsworthy,” said Papenfus.

“One cannot ignore the role of the spectacular growth of the Chinese economy and its impact on global trade, among others, the steel sector. However, over and above the global impact, in South Africa’s case the pain is self-inflicted,” continued Papenfus.

“How do you otherwise explain that, while global crude steel production increased by 5.4% year-on-year in May 2019 (China’s output increased by 10%, India’s by 5.1%, the USA’s by 5.4%, Brazil’s by 2.9% and Egypt’s by 19.8%), and South Africa’s output declined by 10.3%. Some countries (France, Spain and Turkey) also experienced a decline in crude steel production, but not remotely on the scale experienced by South Africa, in effect by AMSA, South Africa’s sole steel producer.”

Papenfus says in South Africa, the steel industry is a victim of policies that resulted in a relentless, devastating process of de-industrialisation.

“Rescuing the South African steel market will require tough operational decisions by AMSA and bold policy decisions by government.”
Metso looks to close Isithebe foundry

Word has it that the parent company has had enough of the militant unproductive workforce and the power blackouts.

In a recent press release that internationally recognised Metso released it stated:

“As part of a global supply footprint development strategy in its Minerals Consumables business area, Metso is initiating consultations to evaluate the potential closure or other alternatives for its foundry operation in Isithebe, South Africa.”

“Our strategy is to utilise synergies of the most efficient manufacturing and sourcing opportunities globally. We are continuously developing our supply footprint to deliver the best value, availability and quality for our customers,” says Sami Takaluoma, President, Minerals Consumables business area at Metso.

However, it is more than likely that the real reason is that the parent company has had enough of the militant and unproductive workforce and the power blackouts. For some years now Isithebe industrial area has been marred by violent protests that saw factories, trucks and public property being torched.

As recently as June 2019 KwaZulu-Natal Premier Sihle Zikalala warned against the burning of trucks and factories as well as violent labour protests saying these actions scare off investors which ultimately leads to job losses. Zikalala was addressing a two-day Provincial Cabinet Lekgotla in Durban.

Zikalala says such violence is absurd behaviour and casts the province in a negative light.

“The recent incidents that have taken place in the province undermine economic growth. These incidents include burning of trucks, torching of business premises in areas such as Isithebe, stoppages and extortion by business forums, intra-party political violence, violent labour strikes, all of these are affecting stability. As a result, it undermines the potential of economic growth in the province,” said Zikalala.

The Isithebe foundry produces metallic wear part castings for the mining and aggregates industries. The foundry has been part of Metso since 1998 and it has approximately 200 employees. In addition to Isithebe, Metso has five of its own foundries, located in Brazil, China, Czech Republic and India, and an extensive global network of external suppliers.

Over EUR 3.5 million invested in foundry in 2017

In 2017 Metso announced that it was investing in its Isithebe foundry to increase manufacturing capacity for crusher wear parts. Over EUR 3.5 million was to be spent including installation of a second melting furnace.

At the time the company released a statement saying:

“Metso is increasing its manufacturing capacity for large crusher wear parts castings used in minerals processing by investing in a second melting furnace at its Isithebe foundry in South Africa. The EUR 3.5 million investment will ensure the availability of Metso’s heavy crusher wear parts globally.”

So the question must be asked: Why would a company that has just invested a sizeable amount of money in South African terms – approximately R56 million at today’s exchange rate – in its South African operation and suddenly pull out? As it is rumoured it can only be external forces that have influenced the decision.

The Isithebe industrial area and surrounding Mandeni area have been beset with labour strikes and service delivery protests. It is reliably learnt that in April 2019 the area had a week of power cuts that were followed by a week of strikes and protests. For these ongoing reasons factories and businesses have often been forced to close and it is no surprise that some take a dim view of this, especially if you are an international company and you can move the work to other production facilities around the world.

In a recent IOL news report the iLembe Chamber of Commerce, Industry and Tourism said an estimated R100 million a day contribution to the gross domestic product by businesses in Isithebe, northern KwaZulu-Natal, is lost due to protests.

“Isithebe-based businesses employ around 21 000 people, with an acceptable multiplier effect of 10:1 resulting in 210 000 people directly benefiting from economic activity in the region,” said iLembe chamber chief executive Cobus Oelofse in the same report.

Metso is a world-leading industrial company offering equipment and services for the sustainable processing and flow of natural resources in the mining, aggregates, recycling and process industries. With our unique knowledge and innovative solutions, we help our customers improve their operational efficiency, reduce risks and increase profitability.

Metso is listed on the Nasdaq Helsinki in Finland and had sales of about EUR 3.2 billion in 2018. Metso employs over 14 000 people in more than 50 countries.
In 2018 Insimbi acquired Group Wreck International for R120 million and in 2016 they acquired Amalgamated Metals Recycling (Pty) Ltd for R284 million.

JSE-listed Insimbi Industrial Holdings (ISB) has informed shareholders that in terms of Section 9 of the JSE Limited Listings Requirements, Insimbi has extended an offer to the shareholder of Treppo, being Texiflash Proprietary Limited (the Vendor), who has agreed to the key terms of the proposed transaction, which will see ISB acquiring control of Treppo which is made up of its MetalCorp and Treppo trading divisions, Bulk Ferrous Exports Proprietary Limited as well as interests in an unincorporated joint venture with CRMN Trading Proprietary Limited, Metfurco Trading Proprietary Limited, Steelco Broking Proprietary Limited and FragCorp Proprietary Limited. The transaction is subject to the fulfilment of all suspensive conditions relating to the proposed acquisition. This follows a cautionary announcement issued 20 March 2019, renewed on 18 April 2019 and 29 May 2019.

Effective date and conditions precedent
ISB says the transaction will become effective once all the suspensive conditions to the transaction agreement have been met. It is expected that a ruling by the Competition Commission may be required as a final condition to be met. All things being equal, it is expected that the effective date will be on or about 1 September 2019, assuming the timely submission of the necessary merger notification to the Competition Commission.

Key suspensive conditions to the proposed transaction include, amongst others, the finalisation of the relevant transaction agreements, funding arrangements, employment agreements with key executives, appropriate immovable property rental agreements, as well as the necessary regulatory approvals as may be required (e.g. Competition Commission).

An additional suspensive condition to the finalisation of the proposed transaction is that no material adverse change would have occurred regarding the business of Treppo as at the Effective Date.

The business of Treppo
Treppo is involved in the sourcing, trading and purchasing of recycled metals, mainly ferrous or steel metal in the greater Gauteng area, South Africa. The business has a 13-year track record in this niche sector of the market and has experienced significant growth during the recent past. The business operates from its Head Office in Marlborough Gate, Hyde Park and premises at 110 Kreupelhout Street, Wadewille, Unit 10A Unifront Industrial Park, Wadewille and 151 South Coast Rd, Rossburgh, Durban.

The business offers services in the field of metal trading, processing, recycling, logistics, procurement and supply of various grades of metals to the local metal melting industry. The business strives to supply local end users wherever possible and will occasionally export limited volumes. The business also has the rights to sell Belgian origin Lefort machinery equipment, a world leader in the supply of metal recycling equipment. It also has a joint venture in a chrome trading venture.

Transaction consideration and other terms
The transaction consideration is an initial amount of R109 million, (including loans), payable by Insimbi to Treppo and its subsidiaries. This is subject to certain warranties by the Vendor regarding the net asset value at Effective Date and future profits to be achieved by Treppo. A further amount limited to R8.5 million may also become payable based on the achievement of certain profit targets set over the initial 36-month period post acquisition. The breakdown of the transaction consideration is set out below:

- **Cash**: Up to R102.5 million in tranches as follows (subject to the net asset value warranty described below) R74 million payable on Effective Date.
- **Vendor Loan**: To the value of R20 million, repayable after a period of three years, bearing interest at a rate of prime less 2%.
- **Repayment of the capital amount may be extended to a maximum of five years, at the option of Insimbi.**
- **Additional payments**: Should Treppo exceed the profit target of R90 million in a 36-month period post acquisition (i.e. an average of R30 million per annum), calculated on a pro rata basis an additional amount limited to R8.5 million will become payable by ISB to Texiflash in cash once certified by the auditors.
- **ISB shares**: 11,538,462 shares to be issued at R1.30 per share equivalent, to the value of R15 million in aggregate, and
- **Profit warranty**: The transaction consideration defined in terms of the offer is however subject to Treppo maintaining an average profit before tax of R30 million per annum for the next three financial years, or R90 million profit before tax in aggregate over 36-months post implementation of the acquisition.
- **Surety**: The Vendor Loans, as well as the ISB Shares will secure the Vendor’s obligations in terms of the final transaction agreements.

As a result of these arrangements, a maximum purchase consideration of R117.5 million may be payable, at a then effective price earnings ratio of approximately 4.1 times earnings.

Net assets and attributable profits
It is agreed that Treppo will, on the Effective Date report Tangible Net Asset Value (“TNAV”) of at least R90 million. Should the TNAV of the business be less than the warranted amount, the acquisition price will be adjusted.

Rationale for the transaction
The rationale for the transaction is to expand Insimbi’s ferrous business, expand its client base, and enhance its access to raw material for purposes of beneficiation, as well as access to an experienced management team and its international trading network and further to exploit the synergies that exist between the two groups which may include cost savings, improved margins, increased global and regional footprint and most importantly, further diversification of Insimbi into a larger industrial conglomerate.

For more information contact Insimbi Group of Companies on TEL: 011 902 6930 or visit the website www.insimbi-ras.co.za
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Breaking the mould with robotic sand milling to generate patternless castings

Omega Sinto robotic milling cell creates waves at GIFA 2019. Mould making lead times drastically reduced by combining a robot with a sand milling solution.

The technology used in modern parts manufacturing has come a long way during the past few decades. The introduction of computer numeric control (CNC) has delivered considerable improvements in machining precision, along with the advent of 3D drawings.

More recent innovations such as additive manufacturing and hybrid manufacturing have led to huge time-savings when creating foundry moulds as well as the components themselves. Maintenance engineers who are looking for new components suddenly have a glut of solutions that can deliver parts in record time.

Robotic solutions in all forms of life are no longer a fascination but a reality. Robots already play a big role in many manufacturing processes and soon enough, robots will use artificial intelligence (AI) to catapult industrial production into spheres that were previously unimaginable to us. The potential of an intelligent and “sensitive” robot is immeasurable.

Patternless castings

Tinker Omega Sinto, an Omega Group Company, is taking advantage of the robotic and the new industrial revolution era that we are experiencing. The US company, in conjunction with the University of Northern Iowa’s (UNI) Metal Casting Center, have developed a robotic milling cell that is set to revolutionise the metal casting industry’s approach towards the traditional manufacturing of patterns and ultimately the castings that they produce.

Jerry Thiel, the director of UNI’s Metal Casting Center is very involved in additive manufacturing for the metal casting industry. They have an S-Max printer and offer printing services to foundries. Two years ago he approached us with a need he saw for producing larger, patternless castings,” explained Wil Tinker, President of Tinker Omega Sinto.

“Larger components are often created by pouring molten metal into a sand mould, which would traditionally have been made using a wooden template. Today, the 3D computer aided design (CAD) can be used with a 3D sand printer to rapidly build a mould that incorporates vents that are positioned to optimise the escape of gases from the mould, ensuring optimum quality of the base material,” continued Tinker.

“An alternative mould making process is to use a multi-axis CNC robot milling tool to create a precision mould from a solid block of sand. This process takes just a few hours, as opposed to the few weeks that would be required to create a traditional wooden pattern. Using the latest technology, lead times can be drastically reduced, especially when the various aspects of the process are well connected, or better, all on the same site.”

“The path generation/file preparation is via an off-the-shelf, third party company Robotmaster. Robotmaster develop CAD/CAM solutions for robots that seamlessly integrate offline programming, simulation and code generation, delivering quick, error-free robot programmes.”

“In this instance they have developed customised software to suit the patternless manufacturing of castings that we wanted to achieve.”

“The Machine Operating Software that then allows the user to synchronise the tool paths and programme in auto
tool changing, auto tool inspection and other functions has been developed by Tinker Omega Sinto. This synchronisation of these two programmes – Robotmaster and our Machine Operating Software – allows the robot to run lights out, overnight completing the mould(s) automatically,” Tinker described.

“The Robot Sand Milling (RSM) platform comes standard with a Mastercam machining/milling software package, a company that Robotmaster has been working with for a number of years and their software is embedded in Mastercam.”

“We have developed the RSM platform with Kuka Robotics but based on the results of the GIFA 2019 exhibition we are now in discussions with other robot manufacturers. Very soon the customer will be able to select his preference of three brands.”

RSM – 25 to 50% of the cost of a printed mould

“The RSM is the start of technology for the future of the ‘patternless’ foundry especially for foundries that have patterns made and don’t use these patterns regularly. The biggest benefit of the RSM is that it provides the foundry with a cost-effective method of patternless casting. Automated robot milling systems can have flexible tooling designed to cater to specific material removal. Any object of any size or shape can be milled by simply adjusting the robot programming and end-of-arm-tooling.”

“Yes, the programming of the robots is very similar to the CNC programming of any other machining operation, but will depends on degree of freedom (or how many axes the robot-arm has) and also on the degree of complexity of the shape of the sand moulds.”

“Additive manufacturing and 3D printing took the foundry industry to another level bringing in big cost and time savings when developing a new product. The 3D printer enables us to create one-off prototypes without having to face the costs associated with traditional mould making.”

“However, during our research and development with UNI, when comparing the cost of a machined mould with a printed mould including equipment amortisation, material cost and run time, we found that the robotic milled moulds can be 25 to 50% of the cost of a printed mould.”

“This represents a huge saving for foundries and their clients. The potential going forward is exciting. We have a steel foundry customer where 80% of his large castings are cast from one-time polystyrene patterns. Our RSM platform will be very beneficial to his production processes as it will also be for art foundry customers who generally make nothing but one-off custom patterns.”

“The first RSM was commissioned at UNI 18 months ago and they then proceeded to fault it, crash it, push it and point out any process issues. We have just provided them with a third revision of the machine operating software.”

“Our goal is to provide a complete, user-friendly package that includes everything the customer needs to make patternless moulds. It is the future,” concluded Tinker.

About Omega Sinto

Tinker Omega Sinto is an Omega Group company, which in turn is part of the Sinto Group. The RSM system will be available locally through Endeco Omega Sinto.

For further information contact Roy Dias of Endeco Omega Sinto on TEL: 011 907 1785 or email roy@endeco-omega.co.za or visit www.endeco-omega.co.za

Amsted Rail announces name change for South African operation – Amsted Foundry Solutions SA

Amsted Rail, the global leader in manufacturing bogie systems for the heavy haul freight market, has established its latest company – Amsted Foundry Solutions SA, with its foundries located in Johannesburg, South Africa.

This newly created company, partially owned by both Amsted Rail and South Africa’s Industrial Development Corporation (IDC), was spun out of Industrial Group SCAW Metals and is the largest supplier of railcar wheels and cast railway components to the South African market. Amsted Rail’s involvement in South Africa began around 2003 and the company continues to make investments to expand their capabilities in the region.

This allows Amsted Rail to better serve customers in the mining, railway, power generating and other industrial markets who require large, top quality precision products. Amsted Foundry Solutions is capable of casting products up to 30 tons finished weight.

Amsted Rail will be managing the entirety of the Amsted Foundry Solutions SA operations, implementing their state-of-the-art processes to create a global leader in South Africa. John Wories, President of Amsted Rail explained: “This investment enables us to better serve customers who depend on Amsted for innovative design and highly engineered components and system solutions for improved product performance and reliability. Amsted’s expertise in premier manufacturing processes will provide substantial growth opportunities for Amsted Foundry Solutions.”
This year’s event saw 225 foundrymen, guests, wives and award winners attended this year’s event. The dinner was well supported by sponsors in the form of prizes for the award winners, ticket sponsors for the award winners and VIP guests invited by the Institute.

The SAIF would like to thank the following sponsors for their valuable contributions to help make the evening a success. These included the guest gifts and tickets for the award winners: African Roots Fondrie, Ametex, Durrans RMS Group, Foseco South Africa, Greencraft Lighting, High Duty Castings, IMP Scientific, Insimbi Alloy Supplies, JC Impellers, Kimberley Engineering Works, Lauds Foundry Equipment, SI Group HA South Africa and Thos Begbie.

Awards handed out on the evening were as follows:

AH Guy Award - For outstanding service to the foundry industry was presented to Rui Dias of Endeco Omega Sinto. 
Lauds Foundry Equipment Technical Award (formerly known as the Colin Butler Award) - for the best technical presentation presented during 2018 by a SAIF Member was awarded to Graham Knight from Metallurgical Testing Labs. His presentation title was: “Introducing Material Testing as a Quality Control Measure”.
Non-Member Diploma - Professor Kyle Metzloff from the University of Wisconsin received the Non-Member Diploma for the best technical paper presented during 2018 by a Non-Member to the Institute. The title of his paper was: “New Developments in Gating Techniques”.
Insimbi Refractory and Alloy Supplies Award - for the highest marks achieved by a 1st year metallurgy student for 2018 was presented to Alex Seya from the University of Johannesburg.
Foseco Student Award - for the highest marks achieved by a final year Metallurgy Student for 2018 went to Gereld Sethosa from the Tshwane University of Technology.
Davidson Nyabadsa of SARCO with Francois Southey, Johan Kotze, Nicolle van Niekerk, Richard Conradie, Yvette Amoore and Ritchie Amoore all from Lauds Foundry Equipment

The AH Guy Award for outstanding service to the foundry industry was awarded to Rui Dias of Endeco Omega Sinto. The Chairperson of the SAIF board Glen Dikgale presented the award

The Foseco Student Award for the highest marks achieved by a final year Metallurgy Student for 2018 went to Gereld Sethosa from the Tshwane University of Technology. With Gereld is Enno Krueger of Foseco South Africa

Lauds Foundry Equipment Technical Award (formerly known as the Colin Butler Award) - for the best technical presentation presented during 2018 by a SAIF Member was awarded to Graham Knight from Metallurgical Testing Labs. His presentation title was: “Introducing Material Testing as a Quality Control Measure”. Graham Knight received the award from Richard Conradie of Lauds Foundry Equipment

The Insimbi Refractory and Alloy Supplies Award for the highest marks achieved by a 1st year metallurgy student for 2018 was presented to Alex Seya from the University of Johannesburg. With Alex is Dudley de Beer of Insimbi Refractory and Alloy Supplies

Learners that completed the Foundry Technology Programme run by the SAIF
Standing Brian Clough and Wouter Retief, both from Ceramic and Alloy Specialists and in the centre Darren Brown of Harcliff Mining Services. Seated is Janley Kotze of Ceramic and Alloy Specialists with Jan Nagel and Willie Paulus, both from Auto Industrial Foundry

Greg MacRae from Prima Holdings, Richard Stevens from Quantus Foundry, Colin Smit from MIS Engineering, Mark Lyons from Quantus Foundry and Ryno van Roeyen from the Durrans RMS Group

Standing Linda, Rocky Bernardes and Joaquim Bernardes and seated Camila Bernardes, Lexette Swanepoel and Sune Bernardes, all from Mustang Foundry

JP du Plessis from the Durrans RMS Group, Johan Haasbroek, Cliff van Eeden and Hennie Coetzee, both from the Durrans RMS Group, Mauritz van Niekerk from Denville Founders, Paul Coelho and Stephanus Nel, both from Lusafrica Founders, Eduardo Evaristo from Action Africa Foundry and Barry Jansen van Rensburg from Donnlee PumpTech

Andrew McFarlane of Ametex, John Taylor of SpecTech and Brad Venter of High Duty Castings

Standing Bhekie Mahlangu and Brandon Panther, both of Endeco Omega Sinto with Rob Horsemann of RSM Foundry and seated Apton Zimucha and Brian Masuku, both from Endeco Omega Sinto
Standing Taz Mabika, Ntokozo Mabaso, David Nkutha and Michael Lehlalerwa all from Weir Minerals and seated Jim Christopher, Ariel Van Flymen and Adam Levin from Pentagon Resources.

Greg and Grant Estman, both from Viking Foundry.

The SAIF would like to thank the sponsors:
- African Roots Fondrie,
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- Country Wide Distribution and Western Cape branch located in Cape Town
Ford’s expansion unleashes new potential for South Africa

Company says it is to add 1 200 jobs from August and is introducing a third shift at the vehicle assembly plant in Silverton to the west of Pretoria.

Ford Motor Company of Southern Africa (FMCSA) will employ 1 200 new employees from August 2019 to meet the growing international and local demand for the New Ranger, Ranger Raptor and Everest models.

Ford said that these additions will bring the company’s total employment in South Africa to approximately 5 500 employees.

At the same time, it will significantly bolster supplier companies by adding around 10 000 jobs in this sector.

“The R3 billion investment in our South African plants, announced in 2017, is now coming to fruition with the addition of a third shift to increase our production output,” says Ockert Berry, vice president operations, Ford Middle East and Africa.

“The investment enabled extensive reworks at the Silverton Assembly Plant to expand our production capacity from 124 000 vehicles per year to 168 000 units, which is 58 000 vehicles more than our original capacity when the current Ranger programme commenced in 2011,” Berry said.

“The third shift will allow us to ramp up our production from the current 506 vehicles assembled per day to a peak of 720 units to satisfy the strong demand from customers in South Africa, as well as for our crucial exports to 148 markets around the world,” Berry states.

Kicking off at the beginning of August, the Silverton Assembly Plant will run around the clock using a three-shift pattern from Monday to Thursday, with the additional Friday third shift available to address any potential shortfalls in the production schedule.

“In addition to the job opportunities created for hourly employees, the new shift makes provision for 104 skilled artisans and technicians who have been appointed as permanent employees, thus adding to the skills set of our staff complement in Silverton,” Berry said.

Growth in South Africa

Approximately two-thirds of Ford’s local production is exported to 148 global markets, with the balance sold in South Africa and Sub-Saharan African countries.

The Ranger leads the light commercial vehicle (LCV) sector exports, with the locally-built model consistently ranked as the top-selling pickup in Europe.

As demand for the New Ranger and the Ranger Raptor continues to grow in Europe, Ford began exporting vehicles through Port Elizabeth in April this year – a strategic move to address the high level of congestion at the Durban Harbour’s Roll On Roll Off (RORO) Terminal, which is the country’s primary import and export hub.

The multi-port strategy makes effective use of Transnet’s rail infrastructure to transport vehicles from the Silverton plant to the Port Elizabeth vehicle terminal. Approximately 1 000 Rangers are being exported via this new route each month, which has improved the efficiency and delivery timeframes to European markets.

Port Elizabeth is also home to Ford’s Struandale Engine Plant, which supports two global diesel engine programmes.

Production commenced at the end of last year of the new-generation 2.0-litre Bi-Turbo and Single Turbo engines that are used in selected Ranger and Everest models, with an installed capacity of 120 000 engines per year – all of which are supplied to the Silverton Assembly Plant.

Additionally, the Struandale plant continues machining component sets, comprising the cylinder head, block and crankshaft, for the existing 2.2 and 3.2-litre Duratorq TDCi engine.

Following the recent investment and expansion, installed capacity climbed to its highest-ever figure of 280 000 sets per year to support export markets in Thailand and Argentina, as well as local engine assembly.

Besides supplying fully assembled engines to Silverton for installation in the Ranger and Everest, the local plant also ships engines to North America, China and several customer plants in Europe with a production capacity of up to 130 000 units per year.
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Important developments emerge from GIFA/GMTN 2019

Those that did not attend will have to catch up as the industry moves full throttle ahead towards Industry 4.0, the Internet of Things, artificial intelligence, robotics as well as a common language for machines to operate.

Speaking to some foundry owners before GIFA/GMTN 2019 to find out whether they would be attending the exhibition it was astounding to hear them utter that they would not learn anything new by attending, the exhibition and what the exhibitors would showcase would be more or less the same as the previous exhibition four years ago and that they were not prepared to spend as they have no plans to upgrade or expand in the future. The less said about those comments the better because the world will not wait for negative thinkers.

I have been attending the GIFA/GMTN exhibition since 1994 and yes, I do admit that for a number of editions of the exhibition there was not much progress in terms of technology except for perhaps faster and more accurate machines. However, this year, with all the technological developments that are constantly happening around us, the prospects of dramatic changes in the foundry industry were anticipated.

Those of us that attended GIFA 2019 were not disappointed and are richer for the experience. Comments from peers in the industry further on reflect this sentiment.

Robotic revolution

In recent years the manufacturing industry has witnessed the dramatic progress of digitalisation and networking typified by Industry 4.0, the Internet of Things as well as the introduction of artificial intelligence. As a result the manufacturing industry environment is undergoing huge changes.

The push towards the Smart Factory was witnessed by my visits to international exhibitions in late 2018 where there was a big emphasis by exhibitors was placed on digitalisation, artificial intelligence (AI) and Industry 4.0.

One of the other most noticeable aspects was the use of robots in various situations, both with man and machine in
attendance. Why, you ask, because robots have been around for some time. The answer is: Full automation with robots is a must going forward if companies want their Smart Factories to operate at maximum performance and productivity. The collaboration between robots and machine has therefore attracted much attention in recent years. As have humans working together with robots in factories. Many tasks on the shop floor can now be automated by using robots, which will help to reduce work-related losses as well as contribute to the bottom line.

You can rely on robots not only for precision welding, bending and cutting or for transporting and depositing, to name a few and you might say that they are good for repetitive and mundane work and operations. However, they are steadily generating increasing sales figures and productivity for manufacturers and users just as reliably. Along with the Industry 4.0 revolution, additive manufacturing and digitalisation, robots are set to play a bigger role in the manufacturing process. And that is even though their huge, boundary-shifting period begun some time ago. Because, soon enough, robots will use artificial intelligence (AI) to catapult industrial production into spheres that were previously unimaginable to us. The potential of an intelligent and “sensitive” robot is immeasurable.

Another noticeable change was the announcement of the number of supplier cooperations that have been setup. For example, Loramendi, voxeljet and ASK Chemicals have taken a major step to reinvent the manufacturing landscape by developing the world’s first fully automated 3D printed core production solution.

I did not expect anything less at GIFA/GMTN 2019. Wherever you walked in the exhibition halls the use of robots was evident. Some stands in the educational section had displays that were dedicated to the use of robots.

The driving force behind the ever-increasing demand for robots is the automotive sector, where robot use is gaining even more momentum. This is followed in areas such as electronics, metal processing, plastics and chemical products as well as the food and beverage industry. In other words, this is a development that will electrify numerous industries.

The foundry and steel industries are not immune to these developments. Already robots are in great use at some forward-thinking companies and we have world-class references in South Africa. Yes, in the foundry industry.

However, one aspect of technological progress in metalcasting is the challenge to synchronise the advances in production processes with the pace of development in information technology and data networks. Die-casters, for example, operate at a very high rate of throughput making it difficult to pause to incorporate changes meant to improve productivity.

Maturity of conventional technologies

The first press conference we attended was for Bühler Die

One of the more attention-grabbing statements was: Maturity of conventional technologies – the potential to optimise Die Casting is more or less exhausted

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Casting where they introduced their vision of the Digital Cell, a solution that they believe aims to deliver 0% scrap, 40% less cycle time, and 24/7 uptime to make the die-casting industry more profitable and efficient.

In his presentation to the media Jonathan Abbis, Managing Director at Bühler Die Casting, put up a slide that included the following statement. It shocked me and all those that I showed the slide to. It read:

Maturity of conventional technologies – the potential to optimise Die Casting is more or less exhausted.

You can’t take the statement in isolation though and I believe it does not just apply to die-casting. Abbis was referring to the challenging market situation that manufacturers in the foundry industry, and I am sure in other industries, are facing. The real point though that Abbis was making is that with all the new technologies now available, and I repeat - Industry 4.0, the Internet of Things, AI, digitalisation, robotics, 3D printing, big data gathering and machine learning that includes AI-enabled visual inspection systems and sensors – it is impossible not to include some or all of these technologies in your future manufacturing processes. By adopting the new information gathering and reporting technologies it offers you the potential for significant increases in productivity and Overall Equipment Effectiveness (OEE). Abbis was emphasising this with the launch of Bühler’s Digital Cell that includes Fusion, Bühler’s next-generation, three-platen die-casting platform.

At the same time Bühler launched their Smart Cell Management System. If we think of a die-casting cell like a human body, with lots of different tasks carried out by different parts, then SmartCMS is the brain, ready to coordinate all of that activity in the most effective way. SmartCMS lays the foundation for the smart management of entire die-casting cells, with the capability to collect information from every component and peripheral in a single control system.

Open Platform Communications Unified Architecture (OPC UA)

Bühler’s concept or vision will be enhanced with the VDMA’s Open Platform Communications Unified Architecture. We attended a presentation given by the VDMA on OPC UA, which is an open interface standard that defines the mechanisms of cooperation in the industrial environment. It enables the industry to integrate its products and its production by information and communications technologies (ICT). In future machines and factories can be redesigned as required by plug and work, irrespective of which manufacturers the machines and components originate from.

The VDMA has been developing with its member companies
companies the OPC UA Companion Specifications over a number of the sector divisions within VDMA, including machine tool and die-casting machines. The VDMA believes that they are close to finalising a standardisation step for a device list within a die-casting cell that includes the HPDC cell controller, the HPDC machine, the metal supply (furnace and dosing system), die lubricant systems, thermoregulation systems, vacuum systems, part separation systems, including trimming, and post processing equipment. Presently most of this equipment and/or systems operate in automation islands - that is until Bühler launched their SmartCMS – and the vision is to change the mindset so as to have a clear role of the devices with standardised smart interfaces. In other words X company’s HPDC machine will be able to talk to Y company’s furnace and dosing equipment, in the same language, as well as all the other devices in the cell, or as they say, allow an interoperable information exchange between manufacturers.

The OPC UA High Pressure Die Casting Initiative, under the umbrella of VDMA Metallurgy and CEMAFON with the OPC Foundation as the custodian, has over 60 experts from over 30 European companies developing the manufacturer-independent information models (Companion Specifications), the interface between components, machines and systems. These describe device and capability information so that a machine can be easily integrated into a plant network by all manufacturers and can, for example, be connected to a software system for planning and controlling production.

Among other things, the description of the manufacturer’s name, the device type and the process data, such as temperatures or pressure as well as organisational information such as information on productivity and quality, will be...
standardised.

Included in this working group are companies from all aspects involved in manufacturing die-cast products and components. They include Audi, Buhler, Fondarex, Frech, IDRA, Italpresse, Kuka, Kurtz, MagmaSoft, Meltec, Stotek, StrikoWestofen and Volkswagen.

**Supplier cooperation**

Another noticeable change was the announcement of the number of supplier cooperations that have been set up.

For example, Loramendi, voxeljet and ASK Chemicals have taken a major step to reinvent the manufacturing landscape by developing the world’s first fully automated 3D printed core production solution.

MagmaSoft and ASK Chemicals are involved in a joint development project on binder decomposition in sand cores and associated gas formation.

MagmaSoft also announced a cooperation with GTP Schäfer, a leading producer of exothermic and insulating risers. Technical riser data of the GTP Schäfer product range is to be made available in MagmaSoft.

MagmaSoft, Hüttenes-Albertus (HA) a supplier of foundry chemicals and the core shooting machine manufacturer Laempe Mössner Sinto presented their unique concept of a virtual core shooting process.

“With approximately 2 360 exhibitors from all over the world, GIFA, METEC, THERMPROCESS and NEWCAST have almost covered the entire international market. Global players, small, innovative newcomers and providers of niche technology alike were all represented,” said Friedrich-Georg Kehrer, the Global Portfolio Director for Metals and Flow Technologies at Messe Düsseldorf GmbH.

Around 72 500 visitors from 118 countries were welcomed into the halls during the trade fair’s five-day run. 70% of the exhibitors hailed from abroad (65% in 2015) and 66% of the visitors came from foreign countries (62% in 2015).

“The demand for European metallurgy and casting technology is particularly strong overseas, especially in Asia. This is also reflected in the international country ranking: China and India edge to the top here, followed by Italy, Turkey, Japan, France and Russia. The mix of nations in our visitor and exhibitor demographics is a crucial factor for the success of the Bright World of Metals. Indeed, that’s what makes this quadruple trade fair so unique. GIFA, METEC, THERMPROCESS and NEWCAST are an absolute must for metallurgy and casting professionals from all over the world,” continued Kehrer.

Dipl.-Ing. Heinz Nelissen, President of GIFA and NEWCAST and CEO of Vesuvius GmbH Foseco Foundry Division, was quick to confirm this: “Right after the trade fair started, any remaining uncertainty caused by the economic slump simply lifted and the rush of visitors was enormous. The huge crowd of high-quality visitors from an incredibly diverse range of international countries was here to see the innovations from our exhibitors. Above all, digitalisation, automation, additive manufacturing and resource efficiency were the focal points of the talks. We undoubtedly proved that GIFA has reinforced this trade fair’s status as a global leader.”

GIFA/GMTN is always considered a yardstick for trendsetting innovations and underlines the importance of efficient production for foundry operations. Foundry owners and operators looking for productivity and advanced manufacturing technologies for their operations had a multitude of solutions to choose from amongst the various exhibitors. These included improved energy efficiencies, process monitoring, integrated automation and environmental considerations. The technological advances in equipment and processes showcased at GIFA/GMTN 2019 leaves no excuses for inefficient foundries in the future.

The next Bright World of Metals exhibition - GIFA/GMTN 2023 - will be held in June 2023. The exact dates will be set over the next few months.

Below are a selection of pictures from the exhibition and observations and opinions made by South African visitors and exhibitors.
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“Allied Mineral Products was excited to engage with multiple end users on a daily basis. With the support of our global team, we could share success stories and tailor-made solutions unique to each potential customer.”

“I would like to thank all our South African visitors, both new and existing for visiting our booth and spending time with us. We are excited and ready for what comes next. We value your trust in Allied Mineral products to make us part of the journey.”

Kevin van Niekerk - Lauds Foundry Equipment GmbH

“WOW what a show! This was a fantastic experience to exhibit among the best of the best.”

“Lauds Foundry Equipment GmbH was able to showcase our capability of supplying a superior German engineered and built product, to the world of foundry experts at GIFA 2019.”

“We had a compact stand for our first exhibition under our German wholly owned company. Our response from all who knew us and from those who did not was remarkable. We have attracted a variety of new international contacts, as well as local European contacts for the many systems we have to offer.”

“Our ability to supply a turnkey solution, custom-packaged as per clients’ requirements, made for many interesting enquiries. We have a solid future ahead of us here in Germany and we look forward to continuing our current growth path and in solidifying prospects, which came about during the GIFA.”

“Lauds will continue to grow our brand globally. Lauds Foundry Equipment GmbH offers a wonderful alternative with German designed foundry equipment. Our ability to respond and adapt gives us the advantage.”

“We have recently signed up three new partnering representatives and we are looking forward in the new opportunities in these countries. We believe we will be attending many more exhibitions and I believe we will showcase our strength and ability as we grow into a global presence.”

Andrew McFarlane - Ametex

“The 2019 GIFA exhibition was a well-coordinated event as it has been in the past. The perception on the Magma booths was that business was positive, which is reflected in the global castings consumption increase.”

“A high interest was experienced from the Asian and other developing economy regions, for both shape casting and continuous casting. Friends from the South African foundries seemed to conclude the exhibition had enough to offer to make a positive difference back home.”

“A good visit was from the University of Johannesburg. Benefits of what the virtual foundry process has to enrich the courses provided by the University were discussed.”

“There is much work to do back home. This includes informing the industry that local foundries can compete on a global scale, casting buyers and foundries can strengthen technical ties through the latest technical tools to optimise the entire casting supply chain and our industry can start growing again.”

Michael Saillard of MagmaSoft with Andrew McFarlane of Ametex

Joubert and Maurie Groenewald from Thos Begbie

Paul Mitchell from Sidermet

Ash Roopchand, Gary Coull and Fred Cooper, all from Pressure Die Castings

Trevor Zuma from Metso Minerals

Richard Conradie and Kevin van Niekerk of Lauds Foundry Equipment
preferred supplier year on year. Nothing happens overnight, but a huge amount happens with patience, perseverance and unflinching dedication of the Lauds team. The utmost priority is our valued clients whom we view as partners, investing in their future.”

Dudley de Beer – Insimbi Alloy Supplies

“This was my fourth consecutive visit to GIFA, and clearly I still have not perfected the correct recipe to gain maximum benefit from this highly rated event.”

“As a trading/supply company, the purpose of our (Insimbi’s) attendance is twofold. Primarily to see as many of our suppliers and principals at one venue, and also to see if any new products or processes are worth investigating for the benefit of our customers.”

“Unlike previous trips where a somewhat flexible plan was envisaged, a concerted attempt was made this time, prior to the show, to confirm as many appointments as possible. Essentially this resulted in virtually having a meeting every hour from early AM to late PM on both of the first two days of the exhibition, with some overflow meetings on the Thursday.”

“The trick here is to attempt at clustering these meetings to specific and or adjoining halls. Something that we were woefully unsuccessful in doing, resulting in several long hot walks between Hall 5 and the rest of the Halls. Sadly this also resulted in me running out of time to stroll through and browse for prospects.”

“As a general overview, the exhibition was superb and spectacular as usual, but I did notice that several repeat exhibitors had booked smaller stands this year. Maybe this was a cost saving exercise?”

“I chatted to many delegates from various countries, and the most positive comments of how the various local metal industries are faring came from the Americans. I guess President Trump’s domestic policies may have merit after all.”

“In summation, once again a very valuable and worthwhile trip, notwithstanding the fact that our accommodation was too far from the Altstadt to partake in meaningful networking.”

Dave Parsad and Raymond Keman – Inkunzi Foundry

“We had heard of GIFA at many of our internal meetings but we never discussed attending GIFA 2019. It was a sudden agreement that Raymond Keman and I, Dave Parsad attend...
GIFA 2019. We were encouraged to do so for good reasons and for the benefit of our company by our third director Vishnu Partab.”

“Besides the ‘heat waves’ and no air-conditioning in our hotel we were very impressed with Düsseldorf. We also utilised the local transportation system with relative ease. The exhibition was phenomenal. We could not do justice in visiting every exhibition stand but nonetheless we have made many business contacts and will be in touch with them shortly.”

“Inkunzi Foundry prides itself with the products we cast and will certainly try our best to keep up with the latest technology and with the world markets. The acquisition of our own machine shop - Spare Parts Manufacturing (Pty) Ltd - earlier this year, has allowed us to offer our valued clients a ‘one stop shop’ service whereby they are able to deal with one supplier from cast product to final machined component ready for use.”

“As for GIFA 2023 we will certainly be looking forward to that trip.”

Rui Dias – Endeco Omega Sinto

“I have attended numerous GIFA exhibitions and have been privileged enough to be able to be both a visitor as well as an exhibitor. Unlike previous years GIFA 2019 was very different.”

“I noticed that many exhibitors have totally embraced the concepts of the future age of doing work, by embracing and developing products that incorporate concepts like AI, Industry 4.0 and IoT.”

“What was very noticeable during my walk around the exhibition was that the corporations and businesses that have not invested in the ‘new’ concepts seemed to attract less interest and these stands looked unattractive and boring.”

“Disappointing was the reducing number of South African foundries supporting these events and whilst for many years technology remained stagnant with little or no development, this year seemed to reflect a quantum leap by the large groups, in development of new products and technologies.”

“We as a global company have invested largely in digitalisation and concepts for the ‘future’ foundry as it is anticipated to become, including all processes and protocols to be controlled by artificial intelligence and the use of technology to better perform the skill and art of foundry practice.”

“Endeco Omega Sinto, as part of the Sintokogio Group all subscribe to the “One Sinto” motto and that is to assist industry in embracing future technologies whilst always taking account of the effect on people and the environment.”

“At GIFA 2019, we launched a new product, the Robotic Sand Mill. This product is the start of technology for the future of the ‘patternless’ foundry, especially for foundries that have patterns made and don’t use these patterns regularly.”

“Sinto also launched technology called “Sinto Smart Foundry” where the complete moulding process is controlled by technology. This technology assists in ensuring an ideal casting production process.”

“Noticeable and a feature and culture of this exhibition that has never changed, is the networking that happens at the famous Altstadt after a long day at the Messe. Whether it is visitors, exhibitors, customers, suppliers or stakeholders in the industry, you are sure to meet a familiar face in the Altstadt.”

“In conclusion, I believe that this GIFA was the start of the process of the ‘future of the modern casting’ process. The continuity will be reflected in the future editions of the exhibition all be it at the cost of huge investment by leading groups in the melting, moulding, consumables and other down-stream industries. Exiting times ahead. See you at GIFA 2023.”

Vanesse Machill – DataProphet

“As a first-time exhibitor at GIFA, the DataProphet team was very impressed by the event overall. With over 70 000 visitors and some very impressive exhibitions, the opportunities to network with potential customers and partners were even better than anticipated.”

“We were invited by our European partner, pour-tech AB,
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to showcase our AI-enabled visual inspection system on their booth. Pour-tech did a great job at designing a welcoming, attractive booth, and our demo station added even more excitement throughout each day.

“The team was overwhelmed by the interest from visitors and were barely keeping up with the demand for more information and further explanation on what they were seeing.”

“The live demo consisted of four DataProphet Inspect stations, each with a surface that displayed various types of defective parts (from small grey iron parts through to brake disks). A structure looking down on the parts consisted of a camera (with our AI software running in the backend), a projector to highlight where the AI model has found a defect and a TV screen for confirmation.”

“The visitors were amazed by the accuracy of the model, especially considering that it was in a live and uncontrolled environment. As our model was already trained on thousands of defect types, we were also able to demonstrate the defect detection on photos of parts that visitors had on their mobile phones, simply by holding their phones up at the camera. This really got the crowd excited!”

“Overall, it has been one of the best events that we have done so far. The overall interest and feedback, from prospective customers and partners, and even industry peers, has been phenomenal. We hope that all who attended/exhibited at GIFA had the same success and inspiration, and we look forward to the next one.”

Brendan Homann – Mineral Zone

“GIFA is a ‘must do’ event for Mineral Zone. It offers us the unique platform to see our suppliers and customers from around the globe in one place over the exhibition week. Mineral Zone is successful because of our relationships on both sides of the sales spectrum and GIFA allows us to revisit old and new friends, and cement our relationships. In an ever-changing world of instant messaging and technology subscribing to instant gratification, it’s so important to bring a human touch and to be present.”

“Exhibitions such as GIFA encourage innovation and cooperation between customers, suppliers and competitors alike. It was a technical eye-opener for us to see the new developments being made around the world, new ideas in products and machinery. Not only did this add fuel to thought about the South African industry, but we found new ideas to tackle markets and encourage growth in a slow economy.”

“As a supplier to the industry we should be constantly re-inventing the way we do business, working together to encourage growth. A stand out theme for us at GIFA is the cooperative approach the industry is taking internationally. Together the industry grows stronger and bigger and more successful. These are the very roots of the Mineral Zone foundation.”

“It’s reassuring to see South Africa’s significance in the global foundry and metallurgical industry. I was surprised to see how much interest there is in South Africa as a producer and as a supplier beyond our borders. The South African industry is extremely well respected and we were encouraged...
Graham Evans – Independent Mineral Distributors

“This was our fifth consecutive stand at GIFA and again we were very happy with the turnout and response. We had a steady flow of people from all corners of the globe through our stand well into the Friday and were impressed by the broad coverage from customers, friends, associates and new interested potential customers.”

“As was to be expected due to the strong growth in the Indian foundry industry there was a huge number of Indian visitors and they seemed to be enjoying the range of suppliers and technology on offer at GIFA. I was amazed at the strong showing from China, around 600 companies exhibiting and over 4,000 personnel attending GIFA. Such a pity that South Africa’s dti chose not to attend or support a South African delegation.”

“We survived the heat wave, entertained customers and made new or renewed contacts. We will be back for sure in 2023.”

Scott Melville – Cerefco

“The Inductotherm Group has been attending the GIFA and Thermprocess shows for decades and it’s always been a great opportunity for us to meet with our customers from around the world. No matter how much the world digitises, there’s nothing more important than establishing and maintaining personal relationships with our customers and partners,” said Gary Doyon, CEO of Inductotherm Group.

“At the show we had 70 project managers from 21 countries, speaking over 30 languages to support our international visitors at GIFA 2019 and Thermprocess. Our team met with over 1,000 customers. All day long there were handshakes and smiles, discussions about technology advances, conversations about future projects, and even business deals,” noted Satyen Prabhu, Group Vice President of Inductotherm Group.

“The Inductotherm Group displayed 11 pieces of equipment, including the Inductotherm 175kW VIP power supply with iSense data visualisation system demonstration, a 750 kW VIP power supply with IoT capabilities and a Tilt-Pour Furnace. Also on display was a ThermaTool HCT (HazControl Technology) welder, a Consarc 20kg Clamshell vacuum induction melting (VIM) furnace, an Inductoscan platinum...
induction scanner, an inductoforge modular billet heater, a Merlin field joint heating and coating system and a Statipower IFP (Independent Frequency and Power) induction power supply,” explained Scott Melville.

“Our customers love to ‘kick the tyres’ so to speak, so it’s always important to them to see our equipment ‘live’, open the doors and talk through our advanced technologies. But we also provided 22 touchscreens loaded with over 500 pieces of content so we could do a deeper dive into the technologies and advancements we provide, and discuss how we align with our customers’ industry advancements,” continued Gary Doyon.

“We want our customers to experience our equipment in a whole new light, so we created a ton of really advanced digital experiences. There was a queue for our virtual reality experience of welding technologies, as well as our extended reality ‘virtual tours’ of a bar line, vacuum atomiser and forge shop. Our customers loved our digital representations of welding lines, bar heaters, strip heaters, forging lines and melt shops,” said Bernard Raffner, Group Vice President and President of the Long Products Division.

“We love greeting and meeting our customers and potential customers from around the world and can’t wait for 2023!” concluded Gary Doyon.

Eugene Rossouw - Thos Begbie

“With the lack of funding for a national South African pavilion, Thos Begbie decided to exhibit in the METEC portion of the exhibition. From my perspective the type of visitor to our stand was very different to those who previously visited our stand when we were located in the GIFA halls.”

“Thos Begbie were exhibiting something technologically new and different to sell as opposed to exhibiting the capacity of our foundry. I hope this subtle distinction is understood. In the past I think we were demonstrating our ability to make sophisticated castings, this time we exhibited the technology that enables us to make the sophisticated cast components in our South African foundry.”

“The application of the use of a composite type cooling approach with the engineered graphite attached to our cast copper components generated a substantial amount of interest.”

“In addition to the meeting up with several existing customers we also met with prospective new customers and will see a few non-disclosure agreements being concluded in the next few weeks as we have follow-up meetings and discussions with them.”

“One of the potentially exciting opportunities was a meeting facilitated by one of our large international customers operating out of Germany. They are one of the leading European furnace and metal engineering groups. Prior to the meeting with them outside of the GMTN exhibition they initiated that personnel from the research institution Aachen University (with more than 42 000 students enrolled in 144 study programmes, it is the largest technical University in Germany) visit our stand and discuss the copper/graphite application for possible installation of a panel in their
development furnace for performance evaluation."

"I believe that we will see business being generated in future as a result of our presence at the exhibition. Given the nature of the exhibition we do not conclude orders directly at the exhibition but our presence and presentation kept us in the forefront of recognition as a global manufacturer when the developers and engineers of the furnaces consider new or upgrading of existing equipment in the smelters and plants."

"With regard to the development of our employees and their enthusiasm to the embracing of new technologies and approaches within our business itself, we had a sizeable number of employees visit the exhibition. There has been much discussion around the Fourth Industrial Revolution and to my mind by having a diverse group of people from our foundry see what new developments there are available in a single exhibition, allows them to understand what the concept is and to what extent we will be able to introduce these developments in our business."

"The employee groups were tasked with specific areas to investigate. The foundry team looked at melting equipment, furnace equipment, lining material, crucibles, moulding equipment, sleeves, blasting media (environmentally friendly), 3D printing and artificial intelligence, fettling equipment, riser cutting equipment, cutting equipment and user-friendly planning programmes."

"The machining team looked at machining tools, machine measurement equipment, cutting machines, automated bending machine for both coil manufacturing and bus tube fabrications, robotic welding for butt welding, artificial intelligence and quality control measuring equipment."

"Given the diversity of technologies most of these objectives were identified. The technology that made a massive impression was the robotic machining of the cope and drag moulds, thus replacing the need for pattern equipment. Given the nature of the bespoke production of castings we produce, we could have use for this type of technology in our business."

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The 3D printing of cores, previously identified with an application in our foundry, was again reinforced. What was noted was the lack of non-European exhibitors embracing this technology. We expected to see Chinese exhibitors promoting their versions of 3D printing equipment and the associated technology. However, the significant presence of Chinese exhibitors in the various halls was noted. In the main most of these Chinese foundry exhibitors were showcasing their ability to make castings rather than innovative technological advancements.

Terence Stopforth – McWade Productions

“With McWade Productions operating as a non-ferrous sand and gravity die-cast foundry we found many exhibitors at this year’s GIFA that were of interest to us.”

“No doubt one of the most interesting exhibits was that of the MagmaSoft stand. We met with Andrew McFarlane from Ametex and were shown in detail the capabilities of Magma, which were very impressive. We were also invited by Andrew to join the Magma boat cruise down the Rhine with some other South African colleagues, which was most enjoyable.”

“On the equipment side it was interesting to see that Endeco Omega Sinto have joined the Sinto Group. Their stand was very interesting and a vast array of products was on display. The virtual reality foundry display was good fun as well.”

“Lauds Foundry Equipment also had a stand and we spent some time with Kevin van Niekerk discussing a few projects that we may have coming up in the near future.”

“On the foundry chemical side we met with Dipanker Raychaudhuri from FP Speciality, our current chemical supplier, and touched bases on the new developments Forace are making and how they will benefit us as a sand foundry going forward. We also learned that Forace will be bringing in some products of interest for our aluminium die cast foundry in 2019.”

“Foseco once again had a fantastic stand with some really interesting displays. Warren Zandberg and Enno Krueger took us around and we were most impressed with their new rotary degasser.”

“All in all the show was quite impressive. There were plenty of new innovations in automation and some impressive equipment on display, to say the least, especially on the furnace side. We found the sales and technical personnel manning the stands to be very willing to assist and technically very knowledgeable regarding their products and processes.”

“From a social point, getting around Düsseldorf is an absolute pleasure, everything works. Evenings spent in the Aldstadt were also most memorable.”

Kulani Mageza – UJ Metal Casting Technology Station

“Attending a prestigious event such as GIFA always brings a learning experience on how far the metal casting industry has gone in terms of development. GIFA 2019 was characterised by the reality of the 4IR where exhibitors and technical presentations showcased advancement on how well they have incorporated and embraced the 4IR. To get into this level where machine and human work very closely together to achieve efficiency in production is an indication of the amount of research and development that has gone through to develop the technology.”

“In my view the digital age has arrived and is here to stay. As a country we need to partake in this digital age through technology transfer, digital skills development and foundry support programmes in order to be responsive to the global competition.”

“Again the GIFA organisers had outdone themselves by organising such an amazing exhibition where time is always a constraint to go through all the halls.”
Three leading technology providers in their fields, Magma GmbH, specialists in the virtual optimisation of foundry processes, Hüttenes-Albertus (HA), a leading supplier of foundry chemicals and Laempe Mössner Sinto GmbH, the core shooting machine manufacturer, have joined forces to establish a long-term partnership. Together, they want to implement their vision of digital core production and thus deliver on the potentials of Foundry 4.0.

In the production of modern, complex castings, it is important to achieve consistent quality in core production, which involves the interplay of several influencing factors and process variables. But it is only at the end of the production process, when you have a finished casting, that you can determine whether the process is able to deliver 100% of the required quality. Foundries would certainly benefit if they could detect possible deviations in advance as this would give them the opportunity to intervene in the process at a very early stage.

And this is precisely what simulation-based visualisations of core production achieve. They make process flow transparent and predictable and take as many process parameters as possible into account. In alliance, this is the vision that drives the new HA, Magma and Laempe partnership.

At GIFA 2019, the three partners unveiled their revolutionary concept for the very first time. The concept is built around a ‘virtual core shooter’. On an interactive screen, visitors were able to adjust various parameters for the core shooting process and assess the results of the simulated core production in real time. As a result, they could see what impact their adjustments have on the shooting process and, consequently, on core quality, answering questions such as: How does the sand height affect the shooting head? What is the impact of vent clogging or tooling cleanliness? At what pressure is the moulding mixture actually shot into the tooling cavity? Which machine settings need to be adjusted to change the tooling design from a single to a split cavity box?

Thanks to the software developed by Magma, the virtual core shooter is able to simulate the entire core shooting process in milliseconds, including material flow and pressure conditions. The empirical data behind the direct simulations were gathered during tests at the HA Centre of Competence.

With this patented new tool, the companies have been able to combine process simulation and real core production. The coupling of the moulding mixture properties with the core shooter and the current tooling allows them to holistically simulate the entire process. Due to the short computing times, it is even possible to integrate the simulation into a real-time operation of the machine.

And the next step has also already been taken: In future, parameters relating to the sand-binder mixture will also flow into the virtual model to make core quality forecasts even more accurate. You will be able to identify core defects that are not visible to the naked eye but nevertheless cause problems further along the process chain. The virtual core shooter is also used to forecast whether a sand mixture can still be used without leading to core quality issues.
It has been announced that Mitsubishi Heavy Industries (MHI) and Primetals Technologies will acquire ABP Induction Systems (ABP), a global manufacturer and servicer of induction furnaces and heating systems from CM Acquisitions, a Chicago, US-based private equity firm.

ABP offers a variety of best-in-class products and comprehensive services to blue-chip customers, including leading automotive OEMs and suppliers, industrial manufacturers, independent foundries as well as steel plant manufacturers and steel producers. MHI and Primetals Technologies will jointly take ABP’s shares. Future business activities will be conducted in close cooperation with and under the leadership of Primetals Technologies. The completion of the acquisition of ABP is subject to the approval of the relevant authorities, and is planned to close around the end of August, 2019.

ABP provides state-of-the-art equipment for ferrous and non-ferrous metal casting, forging and steel making. Its main products are induction melting, holding and pouring furnaces as well as induction heaters. ABP’s business is built upon a large and global customer base with more than 1 600 active units worldwide. ABP also has a core competence in the service business and provides comprehensive aftermarket solutions to customers throughout the entire product lifecycle. Service centres are strategically located close to the major industrial areas in Germany, the United States, China, India, Mexico, Russia, South Africa, Sweden and Thailand.

ABP also exclusively provides special induction heaters to Primetals Technologies for endless strip production, which helps provide a competitive edge. “ABP’s induction heaters are one of the most crucial elements for endless strip production, a flagship process for Primetals Technologies. With ABP becoming one of MHI’s group companies and the further close ties that will bring, we can develop and provide customers with even more advanced technologies. Also, with the acquisition of ABP, we combine its competence in induction heating and related activities with our know-how as a worldwide engineering, plant-building, lifecycle services and digitalisation partner for the metals industry,” said Satoru Iijima, Chairman of the Board and CEO of Primetals Technologies.

“ABP’s well-experienced portfolio and its know-how will certainly complement our wide range of customer plants, namely mini mills and long rolling plants, especially in emerging markets, as well as in endless strip production.” Till Schreiter, CEO of ABP, added: “ABP’s state-of-art induction products and technology-driven culture will fit well with both shareholders. Through a closer tie-up with MHI and Primetals Technologies, ABP can pursue further growth potentials, which will also lead to a contribution to them. With MHI and Primetals Technologies, ABP has access to their resources worldwide, which will improve ABP’s global market presence, provide opportunities to develop new business sectors, and drive digitalisation. This will assure long-term stability for our facilities, employees and customers.”

ABP will be a group company of MHI under the ownership of Mitsubishi Heavy Industries America, Inc., headquartered in Houston, Texas, and Primetals Technologies USA LLC, Alpharetta, Georgia.

For further details contact ABP Induction Furnaces on TEL: 011 623 1814/17 or cell number 072 158 1117 or email byron.mccall@abpinduction.com. You can also visit www.abpinduction.com
The Sinto Group, a world-leading manufacturer of foundry equipment, has announced that they reached an agreement for the establishment of a Joint Venture Company in Turkey with their current Turkish sales representative Expert Mumessililik Tur. ve Tic. Ltd. Sti. (Expert).

The new company will be named Sinto Turkey Makina Sanayi ve Ticaret Anonim Sirketi (Sinto Turkey), and it will be located at Eskisehir, Turkey on the southeast side of Istanbul. “The purpose for this joint venture is to provide all types of products manufactured by Sintokogio Ltd., Heinrich Wagner Sinto Maschinenfabrik GmbH, Omega Sinto Foundry Machinery Limited and Frohn GmbH to our existing and future customers in the Turkish market,” said Mr Atchi Nagai, President of Sintokogio Ltd. “The company is also planning to conduct local production, beginning with spare parts and supplies followed by machinery and equipment in the future.”

Sinto Group companies have been delivering foundry equipment to the Turkish market since the early 1990s and now have 112 customers using their products. Expert is the representative and distributor in Turkey of the Sinto Group, Laempe Mössner Sinto GmbH, Eirich, Elkem and Jöst since it was established in 1992. All of the machines, equipment and materials in their product portfolio have international quality norms and standards.
Sample preparation starts with cutting and good cutting means a good start. Selecting the right cut-off wheel ensures freedom from burn and distortion and is the best way to save time and consumables. Correct cutting produces specimens which are in perfect condition for the next preparation steps.

The aim of mounting is to handle small or odd shaped specimens and to protect fragile materials, thin layers or coating during preparation as well as to provide good edge retention. Mounting produces specimens with uniform size so that it is easier to handle in automatic holders for further preparation steps.

Metkon has delivered more than 20 000 units of sample preparation equipment globally. Their customer list ranges from small to large international companies and laboratories in various industries, such as automotive, aerospace, bearings industry, foundries, steelworks, electronics, universities and institutes and others.

Customers around the world have trusted Metkon to deliver technologically advanced spectrographic sample preparation equipment. Metkon produces most of the components needed in these instruments, allowing for strict control over the entire manufacturing process in accordance with the international ISO-9001 quality standards.

The range of these innovative instruments that are available from Metkon include bench-top and floor-standing surface grinders to swing/automatic grinders as well as fully-automatic milling machines.

Benefits of these instruments include quick and easy preparation of various materials, user-friendly interfaces, dust management for indoor use, various clamping options suitable for ferrous and non-ferrous samples and local back-up with support and consumables.

IMP is the official partner of Metkon in Southern Africa. Between the two companies they have over 60 years of experience in the field. IMP have been providing complete solutions for the materialographic industries since 1987.

For further details contact IMP on TEL: 011 916 5000 or visit www.imp.co.za
Due to increasing requirements, such as shorter time or new regulatory requirements, companies must adapt their development processes to produce high-performance products that are weight-, material- and cost-efficient. This can be achieved with innovative software tools such as Altair Inspire, which enables engineers to quickly produce efficient designs that are reliable in function and manufacturability.

Typical casting defects such as shrinkage, porosity or air entrapment are a big challenge to designers of cast products. While downstream corrections can be quite expensive, casting simulation with modern software tools enables designers to visualise and avoid these defects, thus ensuring manufacturing feasibility.

Shrinkage, porosity, air entrapment, cold shuts and mould degradation are defects that can typically occur in the casting process. They certainly pose a big challenge to designers of cast products. Additionally, as anywhere in product development, product designers of cast products feel the growing pressure to deliver better cast products that cost and weigh less. Hence, in order to create next-generation products, manufacturing feasibility has to be part of the design process. While innovative designs demand designers to evaluate their designs early, assessing whether a concept design of a cast product can be manufactured is a challenging task and traditionally requires a simulation expert. The good news is: Thanks to modern software solutions such as Altair Inspire Cast designers are now able to skip this extra time-consuming and costly step in the development process.

**Simulation as a design tool in five easy steps toward an efficient design**

Altair Inspire Cast is a software tool that enables designers to gain valuable information about their designs early in the product development cycle without the need for expert knowledge. Offering the complete casting simulation in five easy steps through the highly intuitive user experience, Inspire Cast allows designers and foundry engineers to visualise and correct typical casting defects, validate their design, and improve the quality of the final cast product. Casting simulation with Altair Inspire is fast, easy, affordable and it provides accurate results enabling designers to:

- Assess whether a concept design can be manufactured
- Compare concept designs to others with respect to manufacturing
- Reduce manufacturing tryouts by creating design guidelines
- Assess placements of gates, vents, risers and runners
- Validate the detailed design near the end of the development cycle

Experience how to create components with generative design and achieve manufacturability using design relevant parameters such as: Ensuring mould filling and solidification in high pressure die-casting, investment casting, tilt pouring, low pressure die-casting, gravity sand and gravity die-casting.

For further details contact Altair Engineering on TEL: 021 831 1500 or visit www.altair.co.za
With the development of ever faster printers, especially in recent years, 3D sand printing offers foundries completely new possibilities and opportunities. Of course, binder technology has to be developed further, especially for these new productive systems. I am therefore very pleased that we will be able to present new solutions for both inorganic and organic sand core production at GIFA 2019,” explained Dr. Jens Muller, Global Head of R&D and Innovation at ASK Chemicals.

A new requirement profile

With 3D sand printing using the powder binder jetting process, production of sand cores using contour-forming models and core tools is eliminated. The geometry of the sand cores is initially developed digitally based on CAD models.

Next, the recoater applies a layer of a few hundred micrometres of quartz sand fully automatically. Then the binder liquid is selectively applied to the sand bed via the print head. The process of layered sand application by means of the recoater and selective binder input via the print head is repeated according to the specifications of the digital CAD model. Finally, the binder-free support sand is removed, and the printed component may be taken to a post-curing process.

The compatibility and durability of the print head components along with the chemical components of the binder fluid are as critical to achieving success as the application and dripping behaviour of the fluid. This is collectively referred to as “print head compatibility”. The physical and chemical properties of the binder fluid play a crucial role in this process. The physical effects during selective binder input onto the sand bed, such as the migration of the fluid into the unprinted areas of the support sand, must be understood and controlled in order to ensure a high dimensional stability and low finishing cost of the sand cores produced.

“Of course, 3D binders still also have to meet high thermal stability requirements to withstand the stresses during the casting process,” explained Dr. Müller.

New solutions for new requirements

The development of Novaset 3D, a phenolic resin binder for cold curing, has reduced the labour intensive finishing effort and drastically improved the process efficiency over standard binders. Novaset 3D has a low veining tendency and guarantees clean casting surfaces for all types of casting.

The inorganic two-component system Inotec 3D, consisting of an Inotec 3D printing fluid and an Inotec 3D promoter, is applicable for hot-curing additive manufacturing processes. “As a productive inorganic binder system, Inotec 3D stands for zero emissions during core production and core storage and when using the sand cores in the casting process,” emphasised Dr. Christian Appelt, Global Business Manager Inorganic Binder Systems at ASK Chemicals.

Further advantages are the low finishing effort of the sand cores produced, which lead to castings of high dimensional accuracy and surface quality due to the high thermal stability. Above all, Inotec 3D supports current trends in the engine casting segment of the light metal casting industry.

For further details contact ChemSystems® Sales Manager Jacques Swanepoel on TEL: 011 922 1824 or visit www.chemsystems.co.za
Some things are very good at absorbing moisture...

....your mould should NOT be one of them

Novaset 745 & 700

Excessive mould moisture in Alkaline Phenolic binder systems can lead to the generation of hydrogen gas, a major cause of gas defects in castings. Applications with thin-walled castings, high sand to metal ratios and high temperature castings are particularly susceptible to this kind of defect. In many cases, defects are only found later, after fettling, machining and/or X-ray testing wasting both time and money.

The range of Novaset resins from ChemSystems has proved time and again to substantially reduce moisture absorption in the mould, and that translates into far lower scrap and rework rates.

Now there is no need to risk wasting time and money - Novaset resins from ChemSystems can enhance your bottom line and give you the competitive edge.
WE HELP WITH THE MINING OF RAW MATERIALS EVERY DAY

By assisting with the construction of large, high performance machines - with the help of our products and experts.

Your partner to build on.

We cannot do without castings, particularly in the construction of machinery and pump housings for the petrochemical industry.

Foundries have relied on having a strong partner at their side for more than 100 years, with innovative solutions, efficient technologies and products of the highest quality. Together with the expertise of experienced foundry engineers - worldwide and also directly on your doorstep.

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