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- Pyrolog Modules
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- Imported Coatings

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- Morgan Crucibles
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Company Registration No. 75/02765/87
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Compressed air networks
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.

**Membership Fees for 2014**

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
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<td>R100.00 per annum</td>
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<tr>
<td>Individual Member</td>
<td>R700.00 per annum</td>
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<td>R3 000.00 per annum</td>
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<tr>
<td>International Member</td>
<td>R2 000.00 per annum</td>
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All prices include VAT

**Council Appointments for 2013/2014**

- **President** - Enno Krueger
- **Vice President** - Takalani Madzivhandila
- **Treasurer** - Bruce Crawford
- **Immediate Past President** - Luis Dias

**Elected Members**

- Andrew McFarlane
- Justin de Beer
- David Mertens
- Karlien du Plooy
- Janley Kotze
- Kevin van Niekerk
- John Davies
- Nigel Pardoe

**Constitutional Members**

- **President** - Mike Killian
- **Vice President** - Leon Kruger
- **Treasurer** - Bruce Crawford
- **Immediate Past President** - Luis Dias

**Address Details**

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- **Metal Casting Technology Station - Metallurgy**
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- **Postal Address**: P.O. Box 14863, Wadeville, 1422.
- **John Davies** - Tel: +27 (11) 559 6468; Cell: 083 630 2809; email: jldavies@uj.ac.za
- **Executive Secretary** - Tel: +27 (11) 559 6455; Fax: +27 (11) 559 6526; email: mbiljon@uj.ac.za
- Website: www.foundries.org.za

**Editor’s Comment**

The mysteries out there

In addition to the wild speculation by conspiracy theorists, experts and media types are floating a range of ideas as to what might have happened to Malaysia Airlines Flight 370, its 12 crew members, and the 227 passengers on board. Without finding the plane or solid evidence of its whereabouts, there’s no telling exactly what caused the jetliner to vanish. At the time of writing there was still no official information supplied. This mystery has certainly kept the world engrossed especially if you think of how many of us fly.

According to Wikipedia, the territory of Ukraine has been inhabited for at least forty four thousand years (questionable) and it is where the horse was first domesticated. The history of the country reveals many chaotic periods of warfare, most notably after the Russian Revolution, with the Soviet Army establishing control in late 1919. During World War II the Ukrainian Insurgent Army tried to reestablish Ukrainian independence and fought against both Nazi Germany and the Soviet Union. But in 1941 Ukraine was occupied by Nazi Germany, being liberated in 1944. Ukraine became independent again when the Soviet Union dissolved in 1991. Now Russian President Putin is now putting the country through another period of turmoil, which in all probability will lead to warfare. Again there is wild speculation but why we ask ourselves? The mystery is intriguing.

Casting metals into shapes by melting them into a liquid, pouring the metal into a mould, and removing the mould material or casting after the metal has solidified as it cools has been around for thousands of years. The most common metals processed are aluminium and cast iron. However, other metals, such as bronze, brass, steel, magnesium, and zinc, are also used to produce castings in foundries. In this process, parts of desired shapes and sizes can be formed.

Cast iron was first produced in China during 5th century BC but was hardly in Europe until the medieval period. The earliest cast iron artifacts were discovered by archaeologists in what is now modern Luhe County, Jiangsu in China. Cast iron was used in ancient China for warfare, agriculture, and architecture. During the medieval period, means were found in Europe of producing wrought iron from cast iron (in this context known as pig iron) using finery forges.

The technique of metal working by melting and casting was established in Britain about 4000 years ago. Working of wrought iron followed by the mid-first millennium BC, but the production of cast iron did not occur until the 15th century and was initially limited to simple items such as grave slabs, fire backs and cannon balls.

The main growth in casting of ferrous metals came with the industrial revolution. A series of technical breakthroughs in the 18th and 19th centuries enabled cast iron, and later steel, to be produced in large quantities at a much lower cost than wrought iron. Steel (with smaller carbon content than pig iron but more than wrought iron) was first produced in antiquity by using a bloomery. Blacksmiths in Luristan in western Iran were making good steel by 1800 BC.

Iron is the most widely used of all the metals, accounting for 95% of worldwide metal production (citation needed). Its low cost and high strength make it indispensable in engineering applications such as the construction of machinery and machine tools, automobiles, the hulls of large ships, and structural components for buildings. Since pure iron is quite soft, it is most commonly combined with alloying elements to make steel.

This is a brief and unqualified history of the castings industry. However the total world production of castings exceeded 100 million tons in a year for the first time in 2012 and according to experts continues to grow. Yet the science of foundry practice and more specifically molten metal, although more technologically advanced these days, still remains a mystery to most.
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There is a continuing requirement for foundries to manufacture increasingly complex, high performance castings - while driving down production costs. A significant proportion of production costs can be attributed to re-work due to surface defects and these can be eliminated or significantly reduced through the use of the correct refractory coating.

The choice of coating is specific to the metal / mould interactions that are to be overcome, and the rheological properties can be tuned to the application requirements, however a coating will only achieve optimum performance when it is applied at the correct layer thickness. If the layer thickness is too thin, the coating will not provide adequate protection and if it is too thick there is the risk of scabbing defects, the formation of runs and drips and the cost penalty of using too much coating. The layer thickness of the applied coating can be controlled by diluting the as supplied coating with a higher dilution, resulting in a reduced layer thickness. Therefore, variations in dilution through poor process control and measurement, will lead to variations in applied layer thickness, resulting in variations in surface finish, defect levels and re-work costs. Traditionally coating dilution has been controlled through intermittent measurements of the diluted product using viscosity cups or Baume, however the intermittent nature of these tests and the dependence on an operator to interpret results and ensure the coating is homogenised after dilution, inevitably leads to application variations.

These variables can be minimised by the application of an automated coating preparation plant (CPP), and this paper outlines the benefits of such a system in which coating density is continually monitored, and additions of either coating or dilutant are added and homogenised to ensure the product is always optimally supplied for the defined application. The CPP has been developed specifically for metal-casting operations by ProService Srl and is distributed exclusively by Foseco International Ltd.

The CPP is designed to accommodate a wide range of application methods including spray, dip and over-pour, and can be connected to all major packaging systems from drums to bulk silos. The CPP can be configured to work automatically, manually or intermittently dependent on the foundry process.

Features and benefits of the CPP include:
- Continuous monitoring (independent of operator)
- Controlled layer thickness
- Reduced coating consumption
- Optimised drying
- Fewer scrap cores/moulds
- Reduced casting scrap and defects attributed to poor coating practice
- Improved traceability and quality control
- Reduced risk of coating contamination and bacterial attack
- Improved working environment – specifically the handling of solvent based coatings
- Improved productivity
- Reduced casting manufacturing costs
- Improved profitability
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Introduction

Atlantis Foundries (Pty) Ltd is a major South African and international truck engine block producer with an output of 68,000 tons of grey iron per year. The company is a wholly owned subsidiary of Mercedes-Benz South Africa and part of the Daimler Group and is the leading automotive foundry in the country. Atlantis Foundries’ plant is located in Atlantis, approximately 50 km north of Cape Town, along the west coast of South Africa.

Atlantis Foundries have been using Foseco products for the past thirty years. The engine blocks that are produced at Atlantis Foundries are primarily shipped to America and Europe with a smaller number being shipped to other parts of the world.

Being an international player in the automotive industry, Atlantis Foundries strives to keep abreast with all available technology. Foseco South Africa saw the need for Atlantis Foundries to take advantage of the available technology on offer from Foseco and thus entered into discussions with Atlantis management and engineers regarding the optimisation of their coating application. Foseco proposed the Total Coating Management Concept, which would enable Atlantis Foundries to achieve the highest standards possible in coating technology.

Atlantis Foundries background to CPP installation

Foseco first approached Atlantis in:
• 2007: First proposal for CPP given to Atlantis Foundries
• 2009: Due to economic recession the project was placed on “hold”
• 2010: Project to convert from solvent based to water based coating started
• 2011: Proposal for a dual solvent and water based CPP given to Atlantis Foundries
• 2012: Atlantis placed order for the CPP and dip tank
• 2013: CPP and dip tank installed and commissioned by Pro Service / Foseco in January 2013

Prior to the CPP installation

- Coating control using manual flow cup viscosity
- Flow cup viscosity reading was operator / cup dependent
- Manual dipping
- Difference in wet film thickness depending on flow cup viscosity and dipping time
- Coating related scrap

Atlantis Foundries used viscosity as their main control for the coating but it can be shown that this can be influenced by a number of variables.

Example: the viscosity control specification is normally not re-adjusted in the cooler or warmer periods of the year. However, the viscosity is highly influenced by temperature, and without compensation the result will be a difference in the final layer thickness applied, which then impacts on the casting output efficiency.

This limitation can now be overcome. The CPP automates the coating preparation from its supplied state through dilution to a defined specific density and subsequent control and monitoring on a continuous basis to ensure the consistency of the application.

By converting the applied control measures from viscosity to density, variables such as temperature are eliminated, because the solids content of the coating is kept constant and the product application consistency is lifted to a new level of quality.

After CPP installation

- Coating controlled by CPP using “Density Sentinel” probe
- Constant density readings (three decimal places)
- Robot dipping
- Constant wet film thickness readings
- Decrease in coating related scrap

CPP configuration

- Coating storage tank: 2000 litre capacity
- CPP tank: 560 litres preparation tank supplying coating via diaphragm pump to dip tank
- CPP fitted with both “Density Sentinel” and “Viscosity Sentinel” systems
- Dip tank: 2200 x 1200 mm x 1000 mm high and fitted with a swing arm
- Coating runs via gravity back into coating collection tank and using a diaphragm pump, it is pumped back to CPP preparation tank
- In-line modular filters are installed to remove sand deposits from the coating and protect the CPP equipment

Coating application consistency - the total coating management concept

Foseco, together with its partner ProService have developed a stand-alone system, which utilises the accuracy of density measurement to control coating consistency prior to application. The Density Sentinel probe has been developed to operate effectively in the core shop and moulding line environments of a foundry.

As illustrated, the applied wet layer thickness will be
consistent as the coating density is maintained within the specified limits and controlled closely around the target specification. This is because the measurements are continuous and not open to operator interpretation, which can lead to inaccuracies that will lead to poor coating application and increased cleaning/fettling and scrap costs.

Coating application consistency was also improved by the introduction of robotic dipping which provided controlled dip times and core manipulation. When the CPP was first installed the density range was set to between 1.1% and 1.5%, this was subsequently reduced to between 1.02% and 1.03%, indicating that the density can be controlled to a very high tolerance.

The CPP design was adapted to the specific requirements of Atlantis Foundries, in that it:

- Reacts immediately to the coating density changes, ensuring a continuous control of the coating density.
- It should be noted (Figure 3) that over a 24 hour period the Density Sentinel has conducted 226 tests and adjustments to the coating were made when required.
- The unit is fully operator independent, ensuring manual input does not affect coating consistency.
- It is possible to measure the coating density at the required depth (for example, in the case of the dipping application of cores: it is important to verify that the coating density value does not alter according to the dipping depth).
- The Density Sentinel is not affected by the turbulent flows inside the tank.
- The measurement has a very high level of precision (three decimal points).
- The new Density Sentinel Plus allows for the creation of databases, to calculate statistics and to monitor the entire coating shop from one or more stations.

CPPs have been installed by Foseco at many foundry locations globally and have been shown to deliver consistent coating dilution, eliminating variability of coating application and reducing subsequent casting defects and scrap associated with poor coating practice.

**Conclusion**

As the demand for more complex, critical castings increases, the higher quality standards are set, the function and performance of the coating utilised in the foundry process becomes critical. For example, the impact of a high performance core coating on the overall production cost of a typical automotive foundry can be significant, allowing foundries to reduce their fettling, cleaning, and casting inspection operations.

The coating cost is typically a fraction of the total manufacturing costs and usually would be less than 1% of total production costs.

For Atlantis Foundries to maintain a competitive edge within the foundry automotive market and their need to produce increasingly complex, higher quality castings, at increased production levels and with lower overall costs, they had to get the competitive edge by investing in a CPP to optimise the coating preparation and to ensure the consistency and quality of the components being cast.

For more information contact Foseco on TEL: 011 903 9500, www.foseco.com

**References**: Foseco Ferrous Foundry’s Handbook; ProService Technology for Foundry Solutions; Atlantis Foundries
The company specialises in the manufacture of high integrity castings and the manufacture of atomised stainless steel shot and grit and low carbon steel shot.

A partnership that really works for Sigma Wear Parts

“I suppose it was inevitable that I would get involved in the foundry industry from an early age. My late dad Terry Ryan was a foundryman all his life and through his influence I started to work in the foundry industry from the age of 14,” said Eddie Ryan, who is a partner with his brother Andrew in Sigma Wear Parts. “I can’t believe that it was 40 years ago that I first started to help with the metal sampling and analysis at J&C Malleable, the company that my dad was working for at the time. I was given the opportunity to earn a bit of money during my school vacations and I soon realised that school was not for me. Unfortunately I was only allowed to leave school until I was 17. Until I reached that age I continued with my vacation job. The added bonus was that I was given an opportunity to work in the different departments in the foundry.”

“I eventually settled on pattern making and qualified as a patternmaker at the age of 21. I did various courses in foundry practice and metallurgy at college, which helped me become the foundryman that I am today.”

Sigma Wear Parts

“The company name – Sigma Wear Parts – is relatively new. It was only formed 18 months ago when we decided to amalgamate the foundry business of “Thor Wear Parts” and “Sigma Stainless Steel”, our sister company that manufactures stainless steel abrasive media for the surface preparation industry,” explained Eddie. “Both companies have established markets and clients locally and internationally. The foundry business was established in 2002 and the manufacture of stainless steel abrasives began in 2004.”

Sigma Stainless Steel

The Ryan family has specialised in the casting of atomised materials for over three decades.

Terry Ryan was instrumental in forming Thomas Abrasives, which at the time was a division of Thomas Foundry, and began manufacturing low carbon steel shot to supply to both the local and export markets.

Since then the Ryan family have subsequently been involved in various other steel abrasives manufacturing ventures. To date they have designed, built and commissioned five abrasive manufacturing plants. Brothers Andrew and Eddie have been integral members of the family businesses since inception.

A natural extension of the experience and expertise
gained from the various manufacturing processes utilised by the family was to start manufacturing stainless steel shot and grit in South Africa. Thus Andrew and Eddie started manufacturing stainless steel abrasive products under the Sigma Stainless Steel Abrasives label in 2004.

The company is a leading exporter of cast stainless steel abrasives to a very demanding European market. Again the company has proved its resilience and commitment to product innovation and is today a leading manufacturer of these products in the world.

“Manufacturing stainless steel abrasives is a specialised process and needs to produce a very spherical product, sub 1.5mm in size. The tonnage is not high because it is only used in niche areas where contamination must be kept to a minimum, for example high integrity castings in the automotive and aircraft industries,” explained Eddie Ryan.

“Stainless steel abrasive volumes are low as compared to carbon steel abrasives because of cost but what clients don’t realise is that stainless steel abrasives have a much longer life span.”

“Other advantages of why cast stainless shot is a popular product for cleaning and deburring aluminium or non-ferrous parts in air or wheel blast applications, is that it produces very bright surfaces and is ideal for producing finishes free from ferrous residue and it is available in very small sizes.”

“The combination of proper abrasive type and size, along with air blast or wheel blast equipment selection, can produce finishes ranging from a very deep profile to provide an anchor pattern for heavy coatings, a clean, bright, cosmetically pleasing finish without metal removal and a finish stripped of coatings on composite materials without damage to the delicate underlying surface.”

Low carbon steel shot

Although the company slowed down manufacturing low carbon shot over three years ago due to economic reasons such as the high cost of energy input, the strengthening of the Rand at the time, the high price of scrap and the increasing demands of labour, which all led to the product becoming less competitive, it has ventured back into this market but on a much smaller scale.

“We have over 40 years of collective experience in low carbon technology and offer a product meeting and exceeding SAE J2175 and J444 standards. Low carbon shot has a bainitic microstructure, achieved by meticulous raw material selection, constant monitoring of metallurgical chemistry and a controlled atomisation process. Abrasive durability has been reported up to 20% higher than standard high carbon shot with no loss of cleaning efficiency,” explained Eddie.

Production

Two three ton 2000 kilowatt fast melting furnaces drive the production department in the abrasive manufacturing division. The atomising unit and process is unique to and specially designed by the company.

Dedicated product processing lines consisting of retrieval, screening, crushing, classifying and packaging, exist for the different products produced by the company.

All products are issued with a quality control certificate and traceability records are stringently kept.

The foundry - Thor Wear Parts

In 2002 the family added a specialised foundry to the manufacturing mix, concentrating on small specialised castings for a select customer group. The vision was to build close relations with a small group of customers whereby optimum quality and service could be delivered. This strategy has proved very successful with the company seeing growth in both turnover, profit and output in every year since inception, despite the severe impact of the financial crisis.
“With my late Dad, Andrew and I having gained extensive experience in the foundry environment prior to focusing our attention on abrasive manufacturing it was not long before we had the inclination to see molten metal poured into moulds again as opposed to molten metal following the atomising process. Once it’s in your blood you can’t get rid of it,” said Eddie Ryan.

“We received an enquiry for high chrome replacement castings for shotblasting equipment. We had a spare furnace and floor space so it was a matter of sourcing the ancillary equipment and materials that would be needed to start a foundry.”

“In the beginning the foundry was not our priority but as further enquiries came in we took it more seriously and it has evolved into a fully-fledged foundry that has a current capacity of 140 tons per month.”

“We can manufacture castings up to three and half tons net weight per casting using the furnaces in the stainless steel abrasives division.”

“The typical castings that we manufacture include a range of precision components for rotary turbines, paper mill refiner plates, pumps and a whole host of wear parts including crusher spares and some high integrity cast components for the railway industry.”

“The mix of materials is made up of 70% high chrome castings with the rest made up of SG iron, stainless steel and cast iron and to a lesser extent the non-ferrous metals.”

“Recently we added an aluminium casting line that has proved very successful and now delivers very high integrity aluminium castings in various aluminium alloy grades.”

“On the equipment side we currently have two 500 kilogram furnaces, a 5-ton an hour Omega mixer that has been fitted with an auto blend unit and we are currently installing an Omega sand reclamation plant.”

“The laboratory is equipped with a Spectro SpectroMax spectrometer. With it we are able to determine all of the elements used in the cast metal industry, including trace analysis of carbon, phosphorous, sulfur and nitrogen. Our laboratory can analyze all base metals including iron, aluminium, copper, nickel, cobalt, titanium, zinc and lead. Every heat that is melted in our company is analyzed and the results recorded for full traceability.”

The foundry philosophy

“Our philosophy for the foundry is to offer our customers a quality service and to produce high quality castings consistently. Typically we engage ourselves with specialised and more difficult castings, and exciting processes. We like to look at ourselves as the complete cast engineering solution providers.”

“But to portray yourself as this type of business you have to have the equipment that can back-up your statement.”

“In this respect for a number of years we have had a Haas VF 3 CNC vertical machining center to test, run and enhance current and new castings, tool designs and patterns. Highly dimensionally accurate patterns can be manufactured in our patternshop and on our Haas CNC machining center for our customers.”

“We use Solid Edge CAD software to design and develop castings and tooling and we use EdgeCam as our machining software. I must emphasize that this machine is not a
production machine. It is used purely for new development and enhancing existing castings."

“Standing next to the Haas is a Renishaw Cyclone contact scanner which provides us the opportunity to do direct CAD output for reverse engineering, CAM output to machine components and a host of measuring and inspection capabilities.”

“Last year we purchased uPrint SE 3D printer manufactured by Stratasys. It offers a low-cost, networked alternative for printing functional 3D models and tools from the desktop. The printer builds models layer-by-layer using ABS plastic. The uPrint SE 3D printer enables us to evaluate design concepts and test models for form, fit and function.”

“These add on services have been hugely beneficial in our quest to be the complete cast engineering solution providers.”

**New Inductotherm Power-Trak 125-30R and furnace**

“We have now taken this philosophy a step further in our service offerings. In March we installed a 100 kilogram furnace equipped with an Inductotherm Power-Trak 125-30R power source. This unit forms the heart of our new R&D Facility.”

“This furnace also allows us to perform a specialised service in that we can now offer a quick turnaround time for those urgent one-off castings and low volume castings in non-standard metal such as inconel and barium bronze. The size of this furnace dictates the weight of the casting but we are looking at a maximum of 50 kilogram net weight. We will be able to manufacture castings in most metals from this unit.”

Sigma Wear Parts operates from a 4000 m² facility in Lilanton, Boksburg, Gauteng with the stainless steel shot and grit and the low carbon steel shot manufacturing operations housed in one factory, the foundry operations in an adjoining factory and the development and research equipment in another factory.

Currently the company employs 45 staff with 25 in the foundry division and the company has a Level 3 BBEEE rating. The company is fully compliant with the current local and national environmental legislation governing all the processes carried out on site.

For further details contact Sigma Wear Parts (Pty) Ltd on TEL: 011 823 4443
More investors flock to Coega

Two Coega investor projects, with a combined investment value of R700 million, were commissioned by the Ministers of Trade and Industry, Dr Rob Davies, and Energy, Dikobe Ben Martins recently.

The Agni Steels and DCD Wind Towers commissioning comes ahead of the start of major production at both facilities later this month and the promulgation of new legislation on Special Economic Zones (SEZ).

Amendments to the SEZ Bill were passed through the National Council of Provinces and the bill is currently awaiting State President Jacob Zuma’s signature, Davies said.

Both Ministers welcomed the advances in the energy and metals sectors in a first of its kind visit to the Coega industrial development zone (IDZ).

Minister Davies said he was pleased to note the “serious traction the Coega IDZ was generating” attracting companies that will generate energy and inputs into renewable energy and local metals beneficiation. “These are welcome development in terms of this particular IDZ,” said Davies.

“We look forward to these projects achieving success and those in the pipeline coming on stream in the near future – we are pleased to see there has been significant progress at Coega.”

Minister Davies said the combined Port of Ngqura and Coega IDZ public investment amounted to R6.19 billion and that Coega had realised a return on investment of R2.2 billion. The minister however said he was confident that the investment would be recovered as Coega has already signed 23 investors with an investment value of R11.3 billion.

Energy Minister Martins lauded the work of the Eastern Cape in helping to build the nationwide energy imperatives and requirements.

“The Coega IDZ has built the requisite momentum to sustain the projects initiated – projects which span the value chain and constitute a generation project in the realisation of the national Integrated Resource Plan,” Martins said highlighting the Dedisa Peaking Power Plant, DCD Wind Towers and new Coega investor Powerway photo voltaic manufacturers.

DCD Wind Towers started with their initial process qualifications in March 2014 at the 23 000 m² wind tower manufacturing facility in Zone 3 of the Coega IDZ. The facility is expected to create close to 200 jobs, and produce between 110 and 120 wind towers per year.

DCD Marketing Manager for Energy Henk Schoeman said 65% of wind turbine parts could either be manufactured or assembled in South Africa and that the DCD Group had initially invested R85 million in exploring the renewable energy market feasibility – an investment which resulted in the R300 million Coega plant.

“DCD Wind Towers started with their initial process qualifications in March 2014 at the 23 000 m² wind tower manufacturing facility in Zone 3 of the Coega IDZ}

“The tower is the first part of this business. We have shown we can do this, now we are looking forward to growing business within a winning environment in South Africa,” said Schoeman confirming that DCD has already signed contacts with Vestas and Nordex for Round 2 of the Renewable Energy Independent Power Producer Procurement Programme (REIPPP) and has contracts lined up for Round 3.

DCD created over 250 jobs during the construction phase, with more than 90% of the workers coming from the Nelson Mandela Bay region. The factory is anticipated to create close to 200 operational jobs.

Agni Steels SA started operating in March 2014 and has invested R400 million in the first of its kind steel mill in the Eastern Cape. The company has completed pilots and test runs with success, ahead of plans to fire up the furnaces on a permanent basis. Once on, the plant will run 24 hours a day, seven days a week in three shifts and employ 300 people.

The project will benefit from the Minerals Beneficiation Bill of 2011, which incentivises local beneficiation of scrap metal in particular, with Davies saying there is a shortage of specialised steel products which were formerly produced in South Africa but are now imported and that Agni Steels would contribute to reversing this trend.

The high-tech smelting facility will produce mild steel billets from scrap metal. During the first phase of the project the plant will produce steel billets for export to India and other African countries thereby enhancing local beneficiation.

A second and third phase is also planned, with the second phase set to double production, said Dhiroshan Moodley, co-owner of the local operation. “We will create 300 jobs in the first phase and this will build up to 800 in the third phase where we will double our initial investment when we will incorporate a fully automated rolling mill to further benefit the mild steel billets by producing various steel end products.”

Ayanda Vilakazi, Coega Development Corporation (CDC) head of marketing and communications said the ministers’ visit was welcome and highlighted the good work being done by the CDC in terms of attracting investment.

“The fact that two ministers took time out of their schedules to mark the commissioning of two catalytic projects indicates the national commitment, not only to manufacture and industrialisation, but also to the Coega IDZ and its role as a driver of economic growth in the province,” said Vilakazi.
Ceramic Fibre Insulation
Insulation Refractory Bricks
Silicon Carbide Masses
Silicon Carbide Advanced Products
Castable and Monolithic Refractories
Refractory Mould Coatings and Parting Mediums
Insulation and Exothermic Feeding Aids
Refractory Holloware
Refractory Crucibles
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It sounds like a law or accounting firm when you say Boschpick Engineering is run by Peens, Peens & Peens. But you couldn’t be further from the connotation or perception associated with these professions when you visit or engage in business with the company. Brothers Fred, Carel and Johnny Peens are passionate about the business that their father started as a general engineering machine shop in 1973. Moreover their disposition and willingness to please and offer excellent service to their clients, rather than bill huge fees as we know the professions can, is evident from the time you meet the brothers.

The company, which has just reached the 40 year milestone, is based in Newcastle, KwaZulu Natal and despite its remoteness services clients that are located in Gauteng, KwaZulu Natal and the Western Cape.

“Dad identified a need for an engineering company to provide quality machined components for companies in the Newcastle area so opened up a machine shop, which is still an integral part of the business,” said Fred Peens who is the eldest of the brothers and has been working for the company since 1975.

“However the company has since changed its service offerings and today Boschpick is heavily involved in manufacturing mechanical parts, spares replacement and components for light and heavy industry, from raw castings to supplying a fully machined casting or component,” continued Fred, who is a qualified fitter and turner.

The foundry
The brothers have been able to accomplish this because in 1988 they decided to commission their own foundry.

“That was 25 years ago. I had only been with the company for a year then and we had to bring everything in-house because of the quality of work we were getting,” Fred said.

Boschpick Engineering has upgraded its foundry operations to increase capacity and productivity

The company has a 25 litre coreshooter

A closer look at the new shakeout

Boschpick Engineering has upgraded its foundry operations with a shakeout and cooler classifier with an attrition unit supplied by Lauds Foundry Equipment

Boschpick Engineering has invested in a 20 ton an hour continuous mixer that is fitted with an auto calibration unit, supplied by Lauds Foundry Equipment

Boschpick Engineering has upgraded its foundry operations to increase capacity and productivity
just over 10 years when we made a strategic and collective decision to start the foundry. This decision was taken because of our location in Newcastle and where the foundries, our suppliers, were situated. At the time there was not another foundry within a 200 kilometre radius of us. This presented many supply problems,” said second eldest brother Carel who is a qualified blacksmith and is responsible for production, manufacturing and human resources.

The foundry houses two 400 kilowatt 750-1000 kg furnace bodies which are powered by an Inductotherm high frequency induction source. At maximum capacity the foundry is able to produce up to 105 tons of castings per month but is currently producing 80 tons per month, up 100% from when I visited the foundry 12 years ago.

“We concentrate mainly on the steels which make up about 70% of our production. The remaining 30% is made up of cast iron and SG castings. We have cast specials that include 26% chrome and manganese, but the call for these types of castings in our area is relatively small,” explained Carel.

Since Peens Senior retired, the brothers have broadened and diversified the base of their clients and are no longer dependent on the needs of the few well serviced clients who had become reliant on the quality of the castings supplied by Boschpick.

In choosing to diversify, the company hasn’t tied itself down to a specific line of products. Boschpick’s philosophy is rather to operate on a professional basis, based on the individual strengths of each brother and their flexibility in adapting to the circumstances each project presents. Strong partnerships have thus been formed with their increased but small base of 30 clients, which has lead to excellent customer satisfaction, and in most cases Boschpick is the sole supplier to their clients.

Clients include the large internationally recognised steel manufacturing company ArcelorMittal, whom Boschpick service nationally, Natal Portland Cement and state owned enterprises Eskom and Transnet.

Foundry upgrade
A few years back Boschpick upgraded and refurbished their foundry facility. With limited floor space and needing to do more melts per day, and unable to accommodate more boxes on the floor, a holding bin was installed to hold hot sand, which was allowed to cool before being transferred for reclamation. It included the addition of a vibrating table with a special belt to feed the hot sand into the holding bin before it was transferred into the main sand silo. This allowed the floor to be cleared for more casts.

“This met our needs at the time and was an innovative solution. However we found that we were being hampered by the time the sand was taking to cool. Additionally the dust and fines that were emanating from this system did not meet environmental standards,” explained Carel.
“A foundry is a building that works like a big, complex machine with many subsystems, all integrated together. If one of the subsystems is not operating to its potential then the other areas in the foundry will be affected,” continued Carel.

“We have now replaced this system with a shakeout and cooler classifier with an attrition unit (lump reducer). This is not coping so we now have purchased a four ton and a three ton swing crane. This allows us to speed up the process of closing the mould boxes and also move the boxes on for cooling, while the overhead crane is busy on the hot metal side.”

“We are very satisfied with the outcome and as a result of this upgrade we have increased our capacity by 30%. The shakeout, cooler classifier and mixer were supplied by Lauds Foundry Equipment,” said Carel.

Being a niche jobbing foundry, although long runs are also undertaken for clients, all projects engaged by Boschpick are well managed with traceability being of the utmost importance. In this respect they are presently going through the steps of an ISO management certification.

“Our optimum operational level is around about the 70 kilograms per casting where we can cast two castings per box. But if requested we will cast smaller castings,” said Fred.

Facilities offered in the foundry include the pattern shop, shot blasting, a Spectro SpectroMax spectograph and settling. The company also operates a small forge with a maximum capacity of 300 kilograms. Heat treatment is outsourced.

### Machine shop

In the machine shop section machines include CNC milling, turning, and machining centres, gear cutting and supply milling, as well as conventional turning and milling operations. Vertical and horizontal boring milling is also available.

The latest additions in the machine shop have been three Kiheung CNC milling machines, supplied by Machine Tool Promotions, with the largest of them having a six ton load capacity and a XYZ of 3500 x 1500 x 2000 mm.

The company has also purchased two Victor Fortune CNC lathes – a Vturn 26 and a Vturn 36.

In the fabrication division, which is run as a separate but complimentary section, they have a 400 ton press and offer CO2 welding and normal welding. Boschpick assemble all components manufactured by the company, and are able to strip and quote on repairs such as those for gearboxes. The company also manufactures new gearboxes which are installed with a guarantee.

Another speciality of the company has been in the paper industry, where they will refurbish printing presses. The presses are dismantled wherever they are in the country and brought back to Newcastle, where they are stripped. A detailed quote is prepared to include new and reconditioned parts and if accepted, Boschpick re-install the press, commission and run it.

Boschpick can now rightly say they add value to all castings and products produced, which is an essential focus of the business. This also offers their clients the satisfaction that they do not have to ship components from one facility to another.

Today Fred looks after the management aspect of the company. He took on this responsibility when father Fred Senior decided to retire and immigrate to New Zealand in 2002.

As said previously, the second oldest brother looks after production, manufacturing and human resources. The youngest of the brothers, Johnny, joined the company in 1994 and he looks after sales and marketing.

“With our clients based all over the country it does entail some hectic travelling every now and again but we believe in service and if you don’t get to see them you will soon lose them,” said Johnny who likes a game of golf every now and then.

“Although we all have our specific areas that we look after in the company we are all very au fait with each others positions and can easily adapt or fill in if one of us is away on business or holiday,” explained Fred.

“This is important in terms of the security of the company and assurance that clients need. They know that they can speak to any one of the three of us and get action.”

The future looks bright for Boschpick and the company sees new developments that include a bigger foundry with the installation of a larger furnace, moulding area and sand production to enable it to expand. Boschpick would also like to introduce new CNC machines to double up production as the growing need to export to international markets beckons. Although already meeting local South African needs of for example 100 000 items, the international market will require greater volumes, delivery and quality.

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- Progetta: molten metal treatment and automation systems for grey and ductile iron foundries
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Feedback from the 4th BRICS Foundry Forum

The Indian Institute of Foundrymen (Western Region) (IIF) hosted the 4th BRICS Foundry Forum at the Mahatma Mandir, Gandhinagar near Ahmedabad in the state of Gujarat, India. The forum preceded the 62nd Indian Foundry Congress and the Indian Foundry Exhibition (IFEX), coupled with the Cast India EXPO, which was held from 5 to 7 February 2014.

Official representatives from Brazil, Russia, India, China and South Africa, which make up BRICS, reported on the state of the foundry industries in their respective countries as well as challenges and opportunities facing industry in general. The forum is aimed at driving change in the foundry industry with a view of maximising learning between the various participating countries.

Other issues that the forum focuses on include sustainable approaches to foundry industry development, technique refinement, practical approaches to the reduction of pollution, foundry clustering and occupational health and safety. During this year’s forum relationships were strengthened once again between the BRICS countries by discussing the comparative advantages of the countries to the benefit of the BRICS foundry industry.

The focus of the discussions was on aluminium high pressure die casting and global foundry trends. Each country provided feedback on a national foundry level and had to complete a survey on aluminium high pressure die casting foundries in each country.

The South African Institute of Foundrymen (SAIF) CEO John Davies was invited to join the delegation from several foundries and other stakeholders travelling to India with assistance from the National Foundry Technology Network, to represent South Africa at the forum and to attend the congress.

The BRICS member countries produce almost sixty percent of the total world production of castings, which in 2012 exceeded 100 million tons for the first time (Source: Modern Castings / Dec 2013 / 2011 World Production data.). China (42.5 million tons per year) is the only country to experience growth with the other member countries experiencing a contraction in output. South Africa’s output remains small by comparison at 375 000 tons (excluding grinding media) in the same period, but has also contracted.

India is ranked 3rd in world production with 9 344 400 tons annually, with seventy percent production using low-pressure technology. This is in comparison to 520 000 tons in Russia, 550 000 tons in India and 4 450 000 tons per annum by China.

- Energy (electricity and gas) continues to present challenges in cost and quality of supply to all the members. The two main sources of energy to aluminium foundries in the countries are natural gas and electricity, however India uses renewable energy sources such as wind and hydro energy extensively due to the high number of hours per annum the country suffers power outages. It could be as high as 800 hours per annum. Brazil uses more hydroelectric power with the others increasing the use of renewable sources. Input costs however, do not vary greatly from each other. South Africa may even have a slight advantage over India at present.

- The public sector is the main provider or training through training centres and universities. Artisanal training is not fully developed in India or Brazil, with their industries being increasingly focussed in the automotive sectors (In India seventy percent of all die casting production is consumed by the two wheeler and automotive sectors). Significantly, China has 205 universities offering foundry degrees compared with six in South Africa.

- Unattractive wages, a “3D” (Dirty, Dark and Dangerous) working environment and a lack of appropriate training are shared constraints by most of the countries.

- Only Russia indicated favourable rates, taxes and duties for their foundry sector.

- Privately owned companies are in the majority with a trend towards government direct or indirect ownership. Listed public companies are few and far between.

- The automotive sectors are driving the demand in aluminium casting consumption in each country.

- On the export side only South Africa indicated a figure of as high as 40%. This is compared to China 10%, India 8% and Russia 4%.

- The average age of the primary furnace indicated in the
survey is Russia 28 years, South Africa 27 years and China six and a half years.

- The average number of days per annum that the foundry operates is Russia 230, India 300, China 210 and South Africa 240.

“It was notable that all BRICS presentations anticipated future growth to emanate from the automotive sector,” said Mark Krieg.

“The Russian presentation included information of metallurgical developments. With the automotive industry in mind, they talked about developing an aluminium alloy that would combine the benefit of a 3 series alloy with the strength characteristics of the 6 series alloy. This was achieved by seeding with Zirconium.”

“The authorities require car manufacturers to improve fuel efficiency and reduce emissions. In response car manufacturers are putting their vehicles on diet. In the US fuel efficiency is required to double by 2025,” continued Krieg.

“Big news in this regard is Ford’s decision to build their biggest selling F150 truck with aluminium body panels. Similarly, the new Mercedes C-Class assembled in East London is aluminium bodied, and the next BMW 3 Series is announced to follow a similar path to achieve light weight,” explained Krieg.

“Many cast components (drive train, suspension, wheels) are already well established in aluminium, but there are many more items that will be produced as aluminium castings, for example seat frames.”

“In his presentation Andrew Turner, General Secretary of the WFO, showed that global casting volumes have only recovered now to 2008 levels. Much of the growth took place in Asia while European output reduced. Five foundries in the UK closed over the past six months. Turner believes the automotive industry bottomed out in 2013 and anticipates growth in 2014 and 2015.”

“In his conclusion he highlighted the importance of continued investment, citing the example where the UK aircraft renewal program was put on hold and today they have an aging fleet (with reliability suffering and is not fuel efficient) that will be costly to replace.”

“Graham Cooper, a consultant with Inductotherm, addressed post-recession growth with some words of advice to the audience. He said the automotive sector is the largest user of castings with China in the lead and the US a significant player. But, he said, both US and European companies source significant quantities of castings from China and India. He continued to say that actions that would influence growth in future would be bureaucracy, energy and the availability and cost of raw materials.”

“Cooper continued by emphasising that to gain a competitive edge and to succeed you need people, that your business is only as good as the people who work there, and that you need an involved and motivated work force, a management team dedicated to succeeding, a training program that ensures your workers and management are aware of your goals and ensures they have access to the most up to date information and equipment relative to their jobs,” said Krieg finishing off.

“In terms of productivity, South Africa has the lowest conversion efficiency and this is where our future attention should be directed, by focussing on skills development, training and education, increased use of computational design and simulation technology, plant layout and design as well as recapitalisation of productive plant and equipment,” said John Davies.

“One foundry group in India will commission four new foundries this year of which at least two will have very high levels of automation. This is a quality driven decision despite low wage levels and high capital funding costs,” continued Davies.

For further details contact the SAIF on TEL: 011 559 6468 or visit www.foundries.org.za
Executives from three foundries in South Africa, licensed for the Meehanite process, held a conference at the Hunters Lodge in Rustenburg.

The conference discussed current and future trends both locally and abroad. The guest speakers, Dr Dale Edwards from the UK and the current President of Meehanite Worldwide Pekka Kempanian of Finland, addressed the participants on the Meehanite Organisation Worldwide, the use of meehanite castings and other future high tech castings.

Meehanite Africa and Castings Materials assists in the marketing and selling of Meehanite castings in South Africa and countries outside of our borders.

Currently there are four Meehanite Licensees in South Africa. The Franchise agreement covers the entire African continent. The four licensed foundries in South Africa are ArcelorMittal, John Thompson Boilers (A division of Actom Pty Ltd), Lusafrica Founders and BP Wiggill Engineering Foundry.

The History of Meehanite

The origins of Meehanite may be traced back to work carried out in the 1920’s directed towards reducing the annealing time of blackheart malleable iron. In the USA, Gus Meehan reported that grey iron, exhibiting high strength and structural uniformity, together with excellent machinability, could be produced by adding calcium silicide to molten, white iron. He proceeded to call this new material Meehanite Metal and applied to patent its method of manufacture and to license foundries to produce it. On 4 January 1924 a patent was granted and the Meehanite process was born.

In Europe a parallel investigation was conducted by Oliver Smalley, a distinguished graduate from Sheffield University, who reported on the influence of alkaline and rare earth metals such as calcium, magnesium, barium, and cerium on the graphite structure in cast iron. By 1926, Smalley was able to demonstrate that the form and quantity of graphite in cupola melted cast irons could be controlled to achieve tensile strengths of up to 400 N/mm².

In the early years, from 1926 to 1929, only one type of “Meehanite Metal” was produced. This was known as type GA, meaning: for general engineering use but of class graphite with a 345 Mpa tensile strength.

From a designers’ point of view, the development of Meehanite presented a choice of materials having not only superior properties to normal grey cast iron, but also much greater reliability. Traditionally, cast iron was viewed with considerable suspicion, due to its reputation of unreliability; iron castings were frequently criticised for being either too hard in thin sections, or too soft and open-grained in heavy sections. The advent of the Meehanite process was set to challenge this lack of uniformity, although it was not a situation that could be changed overnight.

The need for better organisation and the development of other grades of Meehanite was recognised. The early part of 1929 was devoted to the development of control practices, the development of chill and wedge tests from which the relation between the critical casting thickness and process can be quickly and accurately controlled. Of the many other good fundamental practices was the development of Caloytm, which is still produced and added to the metal mechanically.

It was also appreciated early on that, notwithstanding the importance of thorough chemical and mechanical testing, this merely represented the past history of the melt and only served to record the status of a production batch of castings.

A system of documentation was evolved that would not
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only serve to record test results, but also to analyse them statistically and give advanced warnings of departures from working practices. Meehanite was set to become the international quality leader in the field of iron castings’ production.

Since 1924, the whole concept of Meehanite has been based upon technical innovation, the patenting of the results thereof, and the use of the processes developed by the licensee foundries. Meehanite licensees are thereby provided with the technical means to keep in the forefront of manufacturing developments. Following the original patent on the use of calcium silicide, a stream of others followed, on metal processing, metallurgical plants, nodular iron production, and ultrasonic testing.

The method of adding the calcium silicide – the inoculation process, is still practiced today, after nearly eighty years.

A development programme, which still exists today, was initiated to increase the number of Meehanite Metal specifications. Presently the range of Meehanite metals has been expanded to over fifty different types and will soon be available on the internet.

Meehanite Metals Corporation
In 1926 Oliver Smalley and Gus Meehan joined forces and formed the Meehanite Metal Corporation.

In 1928 the Meehanite Metal Corporation employed Oliver Smalley, to develop other physical properties of Meehanite not covered in the GA range and to develop and promote Meehanite replacements for lower tensile grades on a precise control basis.

In 1939 William (Bill) H Moore, also a distinguished graduate from Sheffield University, was employed by the Meehanite Metal Corporation. He had previously worked in his father’s foundry, Standard Brass, in Benoni, South Africa. Bill intended to rejoin his father in Standard Brass after gaining experience from Meehanite in the USA, but this never came about, Bill eventually became President of Meehanite Worldwide and his passing in November 1989 left the iron foundry fraternity much poorer off.

In 1959 Harry W Kessler, who during the 1930’s had been involved in Meehanite, purchased the Meehanite Metal Corporation from the Hamilton National Bank of Chattanooga where it had been part of the Meehan estate held in trust by that bank. Harry was known as the millionaire metallurgist and also referee of heavyweight boxing world championship matches (mainly contests involving Rocky Marciano).

In 1986 Bill Moore persuaded Mr Lehtonen of J.O.T. Group of Companies in Finland, to buy the Meehanite Worldwide franchise from the Kessler family.

The current President of Meehanite Worldwide is Pekka Kempanian of Finland.

With the close South African connection, Desmond Wiggill, who for many years owned the W.D. Wiggel Foundry in Boksburg, owns the Meehanite franchise for South Africa.

Meehanite Africa and Castings Materials operates with an Advisory Board, which was established in 1985. The constitution of this structure, as revised in 1996, allows one seat for each licensee foundry; the Chairperson is nominated by the licensee representatives and serves a term of 2 to 4 years. The Advisory Board meets tri-annually to discuss developments within the Worldwide Meehanite Association.

The Advisory Board regulates the South African licensee foundries. It sets out parameters for these foundries to be licensed and periodically undertakes audits of each foundry to validate compliance with defined Meehanite practices and procedures.

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What Meehanite has become
Meehanite is not simply a range of high quality engineering materials. The ramifications of the Meehanite process are such that it pervades all aspects of casting production to create a total manufacturing system. Licensees undertake to meet the most stringent casting standards in order to uphold the Meehanite quality ethic.

• Meehanite is an organisation comprising a worldwide network of licensed foundries sharing co-ordinated development and interchange of technology
• Meehanite is a full range of material types, developed to suit all casting applications
• Meehanite is a metallurgical process, which controls the degree of nucleation and the solidification behaviour of cast irons, ensuring that the castings have dense, fine-grained structures, with good machinability
• Meehanite is a practical quality assurance system, geared to the advancement of casting standards
• Meehanite is an information service, communicating product development and technological interchange to the mutual benefit of foundry and customer alike
• Meehanite provides a service to casting users, designed to optimise casting performance
• Meehanite is a vehicle for sales promotion
• And, finally, Meehanite is a registered trademark, recognised internationally as a label of quality.
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Hulamin invests in recycling

Shares in Hulamin gained recently after the aluminium producer posted solid annual results and announced a R300 million investment in a recycling facility as it plans to diversify its metal sources amid mounting concerns about supply from the Bayside smelter.

“...This investment will allow Hulamin to secure competitively priced aluminium inputs and increase its slab production capacity in Pietermaritzburg,” chief executive Richard Jacob said.

Hulamin planned to make the most of a switch to the all aluminium can, from the old steel-lined can. It expected local sales volumes to grow by 10 percent this year and beyond as production was switched to the all aluminium can, to be completed by 2018 to 2020.

Hulamin aimed to source a quarter of its metal from scrap, and the R300 million plant would allow the company to process scrap from street collectors to its distribution channels, he said. It planned to produce up to 200 000 tons of aluminium a year even if BHP Billiton’s Bayside smelter in Richards Bay closed, Jacob said.

Hulamin said BHP Billiton had committed to continue supplying it with rolling slab until year-end. BHP Billiton previously said it was talking to its employees about restructuring its Bayside operation.

This necessitated negotiations between the two over the future of rolling slab supply from the Bayside casthouse.

Hulamin and BHP Billiton have been in discussions for several years over the longer term availability of rolling slab and other value-added smelter products from Bayside.

Hulamin posted a 101 percent increase in underlying profit to R375 million, before metal price lag and impairments, in the year to December last year, the highest since 2008, it said. No dividend was declared.

Headline earnings rose by 132 percent to R183 million, or 57c a share, as turnover increased 15.6 percent to R7.56 billion.

Normalised earnings, excluding a non-cash impairment charge of R1.53 billion and once-off costs related to cutting the workforce, increased 251 percent to R201 million, or 63c a share. The company cut its workforce by 10 percent to 1 900 in the fourth quarter at a cost of R35 million.
The city of Cape Town said it was introducing "creative" measures to combat copper cable theft as well as vandalism of street lighting networks. The city said it would begin replacing copper cables with aluminium in a bid to combat vandalism and theft.

Theft of copper cable is a huge problem in South Africa and costs the country billions of rand a year. Cape Town has been spending millions to repair and replace vital electricity infrastructure as a result of theft and vandalism of copper cable.

The city said there had been several incidents of theft and vandalism reported in the past year. During the first week of December 2013, thieves tunneled into the Brackenfell depot’s store yards. They dug their way underneath the high-security fencing and lifted the paving to gain access, and stole 60 metres of copper cabling. Between December 16 and 29 various incidents of theft and vandalism occurred in Mfuleni. An estimated 230kg of copper was stolen. It is thought that a syndicate is possibly operating in this area.

The city said that as part of other measures to prevent vandalism and theft, cables were being laid deeper than normal and were being encased in concrete. Pole covers have been welded closed and control boxes have been pole-mounted as opposed to ground-mounted, making access more difficult.

In areas where vandalism and theft is particularly rife, the city has started keeping the lights on day and night as a deterrent to criminals.
The Vaal University of Technology (VUT) has unveiled its new advanced manufacturing precinct (AMP) to promote additive manufacturing development and develop scarce skills, research, innovation and technology transfer in South Africa.

More than R60 million worth of infrastructure had been commissioned as part of a sectoral industrial support strategy driven by the VUT’s Technology Transfer and Innovation (TTI) Directorate, TTI executive director Professor Deon de Beer said in a statement.

The AMP is as a result of outcomes of a Rapid Appraisal of Local Innovation Systems (RALIS). The VUT then embarked on a strategic advanced manufacturing drive concentrating on identified industry needs, which could be mapped to internal expertise, capacity and/or infrastructure. Using existing design and additive manufacturing expertise as a foundation, various local and national industry cluster support initiatives have been started, which also supported the meaningful development of the Southern Gauteng Regional Innovation Forum (SGRIF) and VUT Southern Gauteng Science and Technology Park (VUT SG STP).

It was decided that within this initiative that the AMP, which includes an additive manufacturing (AM) centre, be established at VUT. The AM capability is supported by a range of complementary functions including a design centre, an innovation centre, technology station and a project implementation and management unit (funded by the IDC and VUT) to identify and develop regional innovation projects in the Vaal region with a strong focus on front-end engineering in the foundry industry. It simultaneously supports basic and applied research to solve existing industry needs through innovative solutions based on material, product and process development, supplemented by human capital development.

“Many of the technology platforms commissioned are the only ones on the African continent, and international original-equipment manufacturers (OEMs), which have now become industrial partners in this venture, are seeing the VUT’s Technology Demonstration Centre as a gateway to the rest of South Africa and Africa,” said de Beer.

This followed a significant grant in 2013 from the National Research Foundation’s Research Infrastructure Support Grants to co-fund, along with VUT, the Voxeljet technology platforms to support the foundry industry.

Funding to the value of R 8,4 million for the Voxeljet 1000 was awarded in March 2013. The Voxeljet system creates parts by jetting a liquid binder on a bed of finely ground powder. Customised inkjet printing technology is used to print a binder on a powder material such as foundry sand, resulting in fine resolution patterns, moulds and investment casting patterns to directly print complex 3D structures that are ready for casting.

As part of an international research agreement, Voxeljet has indicated that any sand development that takes place in South Africa would be licensed back to their international market. South Africa has a wide range of high quality fine grain sands, which has the potential for important additive manufacturing research development and export opportunities targeting the global market. The pressure on product development, prototyping, and more accurate and cost-effective manufacturing processes are increasing very fast, especially in the transport and power utility sectors where more precise castings at lower scrap rates are needed.

The use of this technology will make the front-end process to casting, design and prototyping functions in the more traditional manufacturing sector more knowledge-intensive, and hence in a better position to compete. The equipment will establish a unique technological platform in South Africa that will immediately be relevant for industry in the short term and offering promising applied research opportunities in the medium to long term by developing applicable advanced manufacturing expertise, supporting front-end engineering using CAD, CAM, Reverse Engineering and AM technologies in parallel with appropriate casting, mould and flow simulation software and supporting accelerated product development, new innovative and integrated product development case studies, for, among others, the foundry industry.

The university said it was already assisting some of its equipment suppliers and OEMs to bridge into the rest of the continent, while engaging in innovative and cost-effective product development.

“The initiative also enabled the university’s TTI and Technology Demonstration Centre, in collaboration with the Metallurgical Engineering Department, to support the foundry industry,” de Beer concluded.
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JVT points out risks of fitting non-OEM vibrating motors to vibrating equipment

JVT Vibrating Equipment’s Managing Director, Fanie Swart has warned users of the risks associated with fitting non-OEM parts, particularly drives and drive components to vibrating screens and feeders.

“It is critically important to the efficient operating of screens and feeders that original equipment manufacturer components are installed,” says Swart.

“Vibrating equipment is carefully and systematically designed to perform to stringent specifications to ensure high efficiencies and robustness are met, specific to the application they are required for,” he continued.

“Screen drive beams are designed for a particular drive type and model. During design, consideration is given not only to the centrifugal force exerted, but also more importantly to the location where this centrifugal force will be transmitted into the beam. Each manufacturer’s designs have different physical dimensions. A non-OEM drive would typically require an adaptor plate to be fitted in order for it to align correctly to the beam. However, these typically have a different footprint to the original equipment. The result is that the centrifugal force will not transmit to the drive beam as per original design.”

“This in turn means that the bolts on the adaptor and motor fasteners will be unduly loaded with additional movement, resulting in excessive stress to the bolts and drive beam.”

“Another consideration is that when the centrifugal force is applied to a position different to that of the design, the efficiency of transferring the centrifugal force may be compromised. The position of the drive and the adaptor plate must be taken into consideration, as well as the additional weight of the adaptor plate. If not, it could result in more force required to achieve the desired result, which in turn could induce higher stresses into the already compromised drive beam design.”

“Further, one needs to keep in mind that original equipment manufacturers have the back-up, support and design infrastructure to ensure fast, efficient problem solving, whereas, non-OEM manufacturers should be held accountable for retrofit parts they supply that ultimately affect the performance and efficiency of the vibrating equipment they are being fitted to.”

“The benefits to end users in ensuring that they are dealing with the right supplier for the right equipment and parts goes beyond that of service and supply. JVT Vibrating Technology is able to reassure users of continued support and supply of OEM parts as it has access to state-of-the-art facilities and inter-group design and manufacturing experience approaching one hundred years. Further JVT is the exclusive African party that is licenced to supply Joest drive systems, exciters, unbalanced motors, dosing drives and many other components including all OEM spares.”

Jöst Germany and Joest (Pty) Ltd’s relationship ended early in 2012. Subsequently Jöst Germany established JVT Vibrating Equipment (Pty) Ltd in South Africa.

“Protected drawings, patents and other intellectual property owned by Jöst Germany may not be utilised by any other manufacturer except those authorised by either Jöst Germany or JVT Vibrating Equipment as it’s local subsidiary,” said Swart.

The Jöst Group has also announced that they have acquired the Johannesburg based fabricator KFJ Steel (Pty) Ltd. KFJ is a sister company to JVT Vibrating Equipment and KFJ will manufacture JVT machines for them.

For further information contact Fanie Swart of JVT Vibrating Equipment on TEL: 011 397 1087 or 082 901 7599 or visit www.jvtvibration.co.za
The South African Institute of Foundrymen invites you and your customers to the 2014 Annual Awards Dinner to be held at the Emperors Palace (Caesars Convention Centre), Kempton Park, Gauteng on Friday 30th May 2014. This is the 51st occasion that the Annual Awards Dinner will take place. Various awards are handed out to industry personnel and students during the evening.

The Annual Awards Dinner is a formal occasion. Please advise your party of the dress requirement i.e. Black Tie. The ladies’ dress is also formal.

For further details contact Marina at the SAIF on TEL: 011 559 6455 or e-mail mbiljon@uj.ac.za

In accordance with the constitution of the South African Institute of Foundrymen, notification is hereby given of the 50th Annual General Meeting which will take place on Tuesday 13th May 2014 at Reading Country Club in Alberton, Gauteng.

For further details contact Marina at the SAIF on TEL: 011 559 6455 or e-mail mbiljon@uj.ac.za

The SAIF had 283 attendees at the various training courses presented in 2013. In addition there were 60 attendees at the In House on demand courses and 31 registered for the workshops and seminars given by the SAIF.

The following courses will be offered by the SAIF for 2014:
- Sand & moulding, cores & core making, quality control, supervisory management, practical resin bonded sand testing, casting defects, heat treatment, stainless steel casting and practical sand testing.
- As the year progresses more courses will be announced.

The SAIF Foundry Operators Program to the industry on compact disc. Intensive research and development has made this information a valuable tool in training to the foundry industry.

The disc includes technical illustrations and lecture notes on the following 13 vital subjects that make up the course:
- Foundry practice
- Microstructures
- Core sands
- Moulding processes
- Coatings
- Moulding sands
- Principles of moulding
- Running, gating and feeding
- Filtration
- Casting defects
- Fettling practice
- Grinding
- Reduced fettling

The cost for the disc is R 3 000.00 for foundries with less than 150 employees and R 5,000.00 for foundries with more than 150 employees. Prices exclude VAT.

For further details contact Marina at the SAIF on TEL: 011 559 6455 or e-mail mbiljon@uj.ac.za
**Investment casting versus additive manufacturing in Airbus study**

Direct metal laser sintering offers improvement over rapid investment casting.

Airbus Group Innovations — the jet builder’s network of technology centers that research technologies and develop products — recently worked with an Additive Manufacturing (AM) process developer on an environmental lifecycle comparison of two critical production technologies. Working with EOS, the center in Filton, England, evaluated both rapid investment casting and direct metal laser sintering (DMLS) for a standard Airbus structural part, including detailed aspects of the overall lifecycle.

EOS is a developer of AM/industrial 3D printing processes, including system technology, software, materials, material development, and other services.

DMLS is a process that converts a CAD design of a part into a .stl file format. This information is read as “layers” by a 3D printer, which deposits metal powders and fuses each success layer to the previous one using a fiber-optic laser, depositing layer after layer of the fused metal to recreate the design in three dimensions.

The eco-assessment involved an Airbus A320 nacelle hinge bracket. Researchers studied the product development from the supplier of the raw material, to the equipment manufacturer (EOS), and the end-user (Airbus). Adapted from Airbus’ streamlined lifecycle assessment (SLCA) and ISO 14040 series requirements data, the testing program will be the basis for continued “cradle-to-cradle” studies into other aerospace parts, processes, and end-of-life strategies, according to EOS.

**Two phase assessments**
The first step involved a SLCA generic bracket to benchmark the DMLS process versus a conventional casting process. With this as a baseline, the researchers compared the lifecycle of a conventionally cast steel bracket with that of a design-optimised titanium bracket (DMLS).

Among their determinations:
- The use phase has the greatest impact in terms of energy consumption and CO2 emissions over the whole lifecycle of the bracket.
- CO2 emissions over the lifecycle of the nacelle hinges were reduced by nearly 40 percent thanks to weight savings resulting from optimised geometry, which is possible thanks to the design flexibility offered by DMLS and by using titanium.
- Most significant, using DMLS to build the hinge may reduce the weight per plane by 10 kilograms — a considerable savings for aircraft OEM’s “buy-to-fly” ratios.

The second phase of the analysis focused on manufacturing a design-optimised, titanium bracket. This comparison pitted an investment casting process versus DMLS with the EOSINT M 280 system.

Among these conclusions:
- Total energy consumed creating the powder metal, then producing the bracket in DMLS, was less than the equivalent steps of an investment casting process; the high energy use of DMLS is limited to the melt and chill cycle of its manufacturing profile, and offset by a reduced build time. Comparatively, investment casting involved the energy consumed to produce an epoxy model via stereolithography (SLA), followed by the furnace operation to produce the casting mould from the model and the finished casting, all of which uses high volumes of energy and generates greenhouse gases.
- The DMLS process used only the material actually needed to make the part, thus eliminating finish machining and reducing consumption of titanium by 25% versus the investment casting route.

“DMLS has demonstrated a number of benefits, as it can support the optimisation of design and enable subsequent manufacture in low-volume production,” reported Jon Meyer, Additive Layer Manufacturing Research Team Leader, in the final report. “In general, the joint study revealed that DMLS has the potential to build light, sustainable parts with due regard for the company’s CO2 footprint.”
THE FUTURE OF FOUNDRY TECHNOLOGY

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Japan-based car maker Honda has made it easy for customers to print models of their cars, using plans on Honda-3D.com. You can find the plans for the last five concept cars from Honda, download them and even modify them. For now, it's just for fun. But it raises the question of whether the car maker or any of its competitors, such as Ford, will release CAD (computer aided design) data and information on materials, so that customers can print their own parts for repairs.

3D printing technology is advancing at a tremendous rate. Printers are improving and getting cheaper too. But printing metals and composite materials has been a challenge for manufacturers and hardcore DIYers. But that's about to change.

A 3D printer that allows users to print composite materials, created by Boston-based startup Mark One, could revolutionize what users are able to print. It wants to make it possible for users to print complex materials—made of various substances. Despite launching at a cost of $5,000, the price tag isn't astronomical. Still, there's a good chance that car producers will be reluctant to put their CAD plans for their vehicles online. Ford Motors, for instance, says it has no such plans. However, in the future, select plans could be released to mechanics, who would then be allowed to print parts, says Sandro Piroddi of Ford Europe.

But we're still only talking parts and not an entire car. Car makers have yet to print an entire roadworthy car themselves. So it's a little early to expect. But it will happen, sooner rather than later.

Boston-based startup Mark One recently announced a 3D printer that can print composite materials.

3D printing marks out the future of car making
Concept Laser introduces the largest component produced to date using the additive process

The approaches of additive manufacturing are currently revolutionizing how development engineers think, while also awakening new desires. For instance, XXL-sized 3D components are currently a trend. The large-format X line 1000R system, which was developed jointly with the Fraunhofer Institute for Laser Technology (ILT) in Aachen, is proving to be a step in the right development direction: into the new dimensions of industrial 3D printing using metals. At the core of the system are optics developed by ILT with a 1,000-watt laser. The jump from the 400-watt class into this new dimension represents a quantum leap in terms of the component sizes and construction rates that can be achieved.

After a successful beta development phase, Concept Laser is now presenting the X line 1000R as a series model featuring the largest build envelope now available on the market (630 x 400 x 500 mm).

The X line 1000R was developed for tool-less manufacturing of large functional components and technical prototypes with identical material properties to series-production assemblies. The key component in the X line 1000R is a high-performance laser in the kilowatt range that enables significant productivity increases compared to other commercially available laser melting systems.

Considerably improved construction speed
The X line 1000R is primarily intended for the automotive industry and aerospace sector. In terms of materials, the system has proven versatile in compatibility: while the automotive industry primarily uses aluminium components for lightweight construction, aerospace applications aim for high-performance materials, such as titanium. From a cost perspective, the possible construction speeds are highly desirable for both industries: while an average system achieves build rates of 10-15 cm³/h, the X line 1000R delivers up to 65 cm³/h (equivalent to a 650% increase). Thanks to patented quality management modules like QMcoating and QMmeltpool from Concept Laser, component quality remains completely intact despite the highly dynamic process.

Conclusion of the beta development phase
After the prototype was presented at Euromold 2012, the focus was on developing the customized mechanical and control engineering; in 2013, the Concept Laser developers concentrated more fully on the actual construction process and material qualification. Dr. Florian Bechmann, Head of Development at Concept Laser: "The agenda for the beta phase included optimization of process parameters and intensive material qualification in order to prepare the X line 1000R for serial production." It also included careful temperature control of the build envelope in order to prevent distortion of "oversize" components. Concept Laser reports the maximum component length as 740 mm.

Largest part presented - initial references highlight the design possibilities
The dimensions of the gear part made of aluminium are considerable: 474 x 367 x 480 mm (not including the height of the build platform). It is currently the largest metal component produced to date using the powder bed-based laser melting process. "When hybrid construction methods are used, geometries can be created that are somewhat above the "basic" construction area dimensions, if necessary, with heights up to 540 mm," says Dr. Florian Bechmann. As a series model, the X line 1000R allows for a significant increase in construction rates, improved surface quality, high reproducibility and system reliability thanks to process monitoring, as well as qualification of a wide range of powder materials for a variety of applications.

New applications devised by the automotive industry
Aluminium alloys (AL) are currently popular among automotive industry customers who work in the XXL range. The material is attractive to development departments for application in lightweight automotive construction. The goal is to replace cost-intensive sand and die casting applications in early development phases. Furthermore, the LaserCUSING process makes it possible to construct lightweight structures with high rigidity and weight-optimised geometries – with virtually no design restrictions.

Aerospace: a driver of development
An increased need for applications using titanium and nickel-based alloys can be discerned on the horizon. These material classes are primarily attractive for the extreme requirements of the aerospace sector. The X line 1000R therefore features a closed system for safe process and powder management compliant with the strict ATEX directives.

"The separation of the process chamber and the handling area is characteristic of Concept Laser and is a relevant feature in terms of safety and quality. This is a fundamental characteristic of the X line 1000R as well," comments Dr. Florian Bechmann.

New applications are currently being devised by development engineers. In addition to drive technology components, these also include test beds in space flight and turbine parts in power plant engineering and aircraft construction. Another interesting application is that LaserCUSING can also be used to repair turbines: a worn-out turbine blade can be mended using laser melting. This means the material of the turbine part, which is still good, can begin a new lifecycle – quickly and affordably.

For further details visit www.concept-laser.de
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International Foundry Exhibition
part of 71st World Foundry Congress

The International Foundry Exhibition is turning out to be an important part of the upcoming 71st World Foundry Congress, where leading metal casting industry personnel and suppliers will present their latest innovations, products and services. The exhibition and congress will take place in the city of Bilbao, Spain, between 19th and 21st May 2014 under the theme “Advanced Sustainable Foundry”.


Highlights such as inbound commercial missions, international business delegations, high-profile visitors, a good location next to the conference rooms and a specialised floor design, are intended to maximise the flow of visitors and the technical and commercial interactions around the event, and the fair is therefore sure to be a guaranteed success.

The International Foundry Exhibition will harness a wide range of business and commercial activity with the presence of a large number of managers, commercial representatives, final casting users, technological and knowledge centres, public institutions and chambers of commerce, as well as the main companies of the foundry and metal mechanical sector.

For more information and booking details, please contact exhibition@71stwfc.com or visit the website www.71stwfc.com

Magnesium alloy picked for aircraft passenger seats

Magnesium alloy has enabled Zim Flugsitz to surpass their weight-reduction targets and improve the fuel efficiency and endurance in this new application,” explained Steve Montisci, European technical sales manager.

“They are the first to realise the weight-saving benefits of magnesium for this type of application, and we have enjoyed working with them to achieve this milestone,” he continued.

Magnesium Elektron alloys have been used previously in military aircraft, and in engine components for civil aircraft. During the past decade, the company has been working with regulatory bodies, aircraft OEMs, and seat manufacturers to gain acceptance for magnesium in civil aircraft interior structures. This included changes to SAE standard AS8049 so that magnesium can be approved for use in commercial aircraft with 20 seats or more.

The FAA approved use of magnesium for aircraft seating last June, and FAA, European Aviation Safety Agency, and the aircraft industry continue their work to finalise the framework for commercial aircraft applications.

“Although it is still a little early to expect a breakthrough into high-volume applications, this project is an important step and will demonstrate the benefits that Elektron magnesium alloys can bring to future ‘light-weighting’ strategies for commercial aircraft designers and operators,” Steve Montisci noted.
Magnesium alloy picked for aircraft passenger seats

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Minerals Technologies wins bidding war for Amcol International

Minerals Technologies said that it had won a bidding war for Amcol International, agreeing to pay about $1.7 billion. The company, based in New York, beat out the French industrial materials company Imerys after a spirited back-and-forth for Amcol, a producer of specialty minerals and materials based in Illinois.

Imerys originally agreed to pay $41 a share for Amcol on February 11, and it subsequently raised its offer twice after Amcol received unsolicited, competing bids from Minerals Technologies.

Imerys declined to raise its offer a third time after Minerals Technologies offered to pay $45.75 a share in cash.

Minerals Technologies and Amcol announced that they had reached a definitive merger agreement, with Amcol paying a $39 million termination fee to Imerys.

“The combination of MTI and Amcol will create a minerals platform that is well-positioned for growth through geographic expansion and new product innovation,” said Joseph C. Muscari, chairman and chief executive of Minerals Technologies.

The transaction, which was unanimously approved by the boards of directors of Minerals Technologies and Amcol, is expected to close in the first half of 2014.

The deal is intended to create a “more robust U.S.-based international minerals supplier” with a broader product focus, the companies said. The combined company is expected to have more than $2 billion in annual revenue.

Amcol is a leading producer of bentonite, which is used in machine tooling, construction and drilling. Minerals Technologies manufactures precipitated calcium carbonate, which is used in the paper industry and which accounted for about half of its revenue last year.

“This transaction demonstrates the Amcol board’s commitment to maximizing value for our shareholders,” said Ryan F. McKendrick, Amcol’s chief executive. “We look forward to working with Minerals Technologies to ensure a smooth transition and complete the transaction as expeditiously as possible.”

Minerals Technologies plans to finance the deal using cash and debt financing.

Amcol, with a presence in 26 countries, posted revenue of more than $1 billion in 2013.

Minerals Technologies, which was spun off by Pfizer in 1992, had revenue of $1.02 billion last year.

GF sells gravity diecasting plant

Sale of Austrian auto parts plant “completes streamlining” at GF Automotive.

The Georg Fischer group has sold an aluminium diecasting plant in Herzogenburg, Austria, to a group called Kimaz GmbH, formed by the management of that operation. The value of the sale was not reported.

The gravity diecasting plant manufactures aluminium parts for passenger cars and trucks, and has about 200 employees. “We believe in the potential of gravity diecasting, and are convinced that in cooperation with our workforce the plant in Herzogenburg will stay a reliable partner for our customers and suppliers as well as a significant regional employer,” explained Andreas Zick, co-owner of Kimaz GmbH.

Georg Fischer operates several iron and aluminium casting operations as part of its GF Automotive business unit.

It continues to operate a ferrous foundry and an aluminium pressure diecasting plant at Herzogenburg, and those continue to be part of the Georg Fischer organisation. It also will supply some plant and management services to Kimaz.

“The solution found for the gravity diecasting activity in Herzogenburg ensures continuity for our customers and our workforce,” according to Georg Fischer CEO Yves Serra. “It also allows GF Automotive to fully focus on its core activities.”

In late 2012 the group announced plans to downsize its European foundry network, while expanding its metalcasting operations in China. At that time, it sold two foundries in Germany to the MWS Gruppe.

In the months since then, GF Automotive started up a new automated pouring line at its ductile iron foundry in Mettman, Germany, and announced plans for a new molding line at the ductile iron foundry in Singen, Germany.

In China, the group has a ductile iron automotive foundry at Kunshan and an aluminium and magnesium diecaster at Suzhou.
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HA
Alcoa to close
Australian smelter and mills

Aluminium giant Alcoa plans to close down a smelter and two mills in Australia by the end of the year, affecting nearly 1,000 jobs.

Alcoa has announced that it will permanently close its Point Henry aluminium smelter and two rolling mills in Australia. The smelter and an adjacent rolling mill are located in Geelong, Victoria. The second mill and a recycling facility are located in Yennora, New South Wales. The smelter will close in August and the rolling mills by the end of 2014.

The Point Henry smelter was placed under strategic review in February 2012 due to challenging market conditions. A comprehensive review found that the 50-year-old smelter has no prospect of becoming financially viable. The two rolling mills serve the domestic and Asian can sheet markets, which have been impacted by excess capacity. Alcoa of Australia operates the smelter where approximately 500 employees work. Alcoa Inc. operates the rolling mills which employ about 480 people.

“We recognise how deeply this decision impacts employees at the affected facilities and are committed to supporting them through this transition,” said Chairman and Chief Executive Officer Klaus Kleinfeld.

“Despite the hard work of the local teams, these assets are no longer competitive and are not financially sustainable today or into the future.”

The Anglesea coal mine and power station that currently supplies approximately 40 percent of the power needs for the Point Henry smelter has the potential to operate as a stand-alone facility after the smelter closes. Alcoa of Australia will actively seek a buyer for the facility.

The Portland Aluminium smelter in Victoria will continue normal operations, as will Alcoa of Australia’s bauxite mining and alumina refining operations in Western Australia.

“These are hard decisions to make,” said Alan Cransberg, Managing Director, Alcoa of Australia Limited.

“We understand how difficult this is for our employees and their families, our contractors, suppliers and community partners. Everyone has worked hard to improve the competitiveness of the smelter and rolling business. They are part of a proud history of Alcoa in Australia over the last 50 years and part of the significant contributions we have made to the Australian economy and local communities. We appreciate the ongoing support of the Australian and Victorian governments and will continue to work closely with all levels of government, our employees, unions and community stakeholders to manage through these changes.”

The closures will reduce Alcoa’s global smelting capacity by 190,000 metric tons and reduce Alcoa’s can sheet capacity by 200,000 metric tons. Including the closure of the Point Henry smelter, Alcoa has announced closures or curtailments representing 551,000 metric tons of smelting capacity, exceeding the 460,000 metric tons placed under review in May 2013. Once the Point Henry closure is complete, Alcoa will have total smelting operating capacity of approximately 3,760,000 metric tons, with approximately 655,000 metric tons, or 17 percent, of high cost capacity offline.

WFO welcomes new President

Mr. Vinod Kapur has been elected as World foundry Organization (WFO) President for 2014 and 2015.

Vinod has served on the WFO Executive board for the past five years and is a former President of The Institute of Indian Foundrymen. He is the Chairman and Managing Director of Gargi Huttenes Albertus Pvt. Ltd, a well-respected businessman and foundry material supplier based in Mumbai.

Vinod has long been a familiar face in the foundry industry throughout the world, having joined the then Institute of British Foundrymen in 1973 and has travelled around the globe to develop his extensive knowledge of the Cast Metals Industry.

WFO General Secretary, Mr. Andrew Turner said: “We are delighted that the membership voted unanimously for Vinod to take over the two-year role as WFO President. He is a worthy choice having developed a very successful company in India which represents several global foundry supply companies from Europe. Vinod’s passion for the industry and for the people employed in it will be an asset to the WFO.”

Vinod takes over the honorary Presidential role from Mr. Xabier Gonzalez Azpiri of Spain who has held the position for the past two years.

Speaking of his appointment Vinod said: “I am very thankful to the WFO General Council for their confidence in me and having elected me as President of WFO for the years 2014 and 2015. I feel proud to be in this esteemed position, to represent my country and of course The Institute of Indian Foundrymen”.

Mr. Vinod Kapur
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Contact the company closest to you.
The target group for the 13th International foundry Gifa 2015 are all the companies around the world that are interested in presenting their operations in the following areas: foundry and melting plants, refractories technology, machines and equipment for moulding and core making, moulding sands and moulding auxiliaries, sand preparation and reclamation, gating and feeding, casting machines, knock-out, fettling, finishing, pattern and die-making, control systems and automation, environmental protection and waste removal as well as information technologies. Gifa has been a major part of the Messe Düsseldorf portfolio since 1956 and set a new record the last time it was held in 2011, with 780 exhibitors from 45 different countries and 48,700 trade visitors (53 per cent of them from countries outside Germany).

Metec, the 9th International Metallurgical Trade Fair, reported another increase in exhibitors in 2011. A total of 486 companies from 33 countries presented their know-how about the growing metallurgical sector and demonstrated that they are actively involved in making sure that operations are both efficient and environmentally sound in future thanks to their product developments. Metec has been one of the four trade fairs since 1979 and focuses on equipment for iron, steel and non-ferrous metal production, for casting and forming steel, for environmental protection, waste removal and gas purification, for electrical engineering and process technology, for measurement and test technology, for information technology, for metallurgical plants, rolling mills and steel mills. In 2011, more than 18,000 trade visitors came to Metec to obtain information, with half of them travelling from European countries outside Germany or from overseas.

Thermprocess has a long tradition too: the international trade fair has been the place to find innovative thermo process technology since 1974. Presentation of the latest trends for solutions relating to the production and operation of industrial furnaces and heat treatment plants enables visitors to obtain information that keeps them up-to-date with industry developments. The range includes industrial furnaces, industrial heat treatment plants and thermal processes, equipment for special uses, components, equipment and other supplies, occupational safety and ergonomics. Both exhibitors and visitors gave Thermprocess 2011 top marks: 96 per cent of them said that their involvement in the trade fair had been a complete success, for example. All in all, 305 companies from 30 different countries presented their products and services to 7,900 visitors, 45 per cent of which came from outside Germany.

The newest addition to The Bright World of Metals is Newcast, which has been the fourth member of the quartet since 2003. It is the most important trade fair in the world for precision castings, is the highlight of its industry every four years and has recorded excellent growth rates. The sectors covered by the castings range from car manufacturing and the aerospace industry to machine and plant manufacturing and medical engineering. In 2011, 374 companies from 30 different countries exhibited their products and services at the 3rd Newcast. More than 3,500 trade visitors, over 50 per cent of them from outside Germany, were impressed by the large selection of exhibits: ferrous metal castings, iron, steel and malleable foundries, non-ferrous metal castings, aluminium, zinc, copper, magnesium, nickel and other non-ferrous metal foundries, services, forging, sintering, trade and logistics. They gave Newcast excellent marks, with 95 per cent of them saying that their trade fair visit had been extremely positive.

Online registration for the four trade fairs is possible via the following links: www.gifa.de/2330, www.metec.de/2330, www.thermprocess.de/2330 and newcast.de/2330

Trade Fair Travel and Castings SA tour
Trade Fair Travel, a specialist travel agency for trade fairs internationally and in particular Germany, have put together a very reasonable tour package to visit this exhibition.

The tour includes return airfare Johannesburg/Düsseldorf, airport taxes, airport/hotel transfer, accommodation, full breakfast daily and medical and travel insurance.

For a booking form contact Trade Fair Travel on TEL: 031 916 1414, Fax: 031 916 5674 or email peter@tradefairtravel.co.za or visit www.tradefairtours.com.

Trade Fair Travel is also able to offer you individual packages, tailored to your requirements. For more information contact Peter Stephenson on the number above. Booking forms can also be downloaded from the website.

The four successful trade fairs Gifa, Metec, Thermprocess and Newcast are being held again in Düsseldorf under the motto “The Bright World of Metals” from 16 to 20 June 2015.

Countdown to The Bright World of Metals 2015 has started
A trusted industry leader

For 90 years, SCAW, a South African industry leader, has been a leading supplier of cast products to industries that are the backbone of our South African economy. When safety and productivity are at stake, customers depend on Scaw’s 90 years of experience and expertise to design and manufacture castings to the highest international manufacturing, safety and environmental standards.

With one of the largest foundries in the Southern Hemisphere, Scaw produces an extensive range of products cast, machined and delivered to customer specifications or under international licence. Customers, both nationally and internationally, continue to choose Scaw products and expertise.

www.scaw.co.za
Norton Saint-Gobain Abrasives bring their latest abrasive technology products to South Africa

Norton Abrasives has developed the Norton Vitrium3 bonded abrasives products, engineered for maximum performance and cost savings in precision grinding.

Having manufactured in South Africa for decades and with the world becoming easier to trade across it’s continents, it was time to introduce the many technical advancements of abrasive products to South Africa directly from the numerous Norton manufacturing plants from around the world. An intense effort is currently being made to migrate customers over to the new products and the results so far have seen an increase in product life and productivity for customers.

An entirely new abrasives platform, Norton Vitrium3, features a patent-pending bond technology developed by the Saint-Gobain Abrasives R&D team. This bond features an exclusive chemistry that promotes grain adhesion, resulting in improved product versatility across a wide range of applications.

Substantial performance improvements with Norton Vitrium3 are now attainable in all Norton abrasive grains, from proprietary Norton Quantum ceramic alumina to conventional aluminium oxide.

Norton Vitrium3 has three major features and benefits over standard vitrified bonds:

- A stronger bond construction allows superior form and corner holding for improved part quality and higher tolerances, reduced dressing time and wear, as well as the ability to meet the higher wheel speeds demanded of today’s equipment.
- An improved holding power using less bond-to-abrasive ratio. This allows increased exposure of the abrasive grains for an improved cut rate and significantly less burn, while reducing power consumption and grinding forces on the part.
- An increased porosity improves coolant flow and chip clearance to eliminate burn or other part damage, especially on today’s tough-to-grind materials, such as high nickel alloys, tool steels and chrome.

For further details contact Saint-Gobain Abrasives on TEL: 011 961 2000 or visit www.saint-gobain.co.za

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The use of efficient filter systems to remove contaminants and reduce turbulence plays a defining role in the quality of castings. The manufacturer of foundry aids ASK Chemicals provides a comprehensive filter product range for this reason. The specialist company from Hilden supplies highly efficient foam ceramic filters for steel and iron foundries. These filters are manufactured from a very wide range of ceramic materials such as pure zirconia, aluminium oxide – also carbon-bonded – silicon carbide and other special materials. The Udicell and Exactflo filter systems support quality issues such as high metal purity as well as economic objectives through a reduction in additional work and a low rejection rate.

In particular, the fully sintered Udicell foam ceramic filters, produced from partially stabilised zirconium oxide (PSZ) are the first choice for use in steel and iron foundries. Thanks to their chemical, thermal and mechanical robustness, Udicell filters have a very high load capacity and enhance efficiency during the production of steel castings and medium to large iron castings as well as in investment casting.

Attuned to customer-specific requirements, ASK Chemicals develops and produces tailored filters with special surfaces and seals. This ranges from the smallest designs for investment casting right up to top solutions for cast parts in the multi-digit tonnage range.

Foam ceramic filters are also used in other areas of industry, e.g. as kiln furniture for sinter furnaces, flameless burners or for filtering flue gas. ASK Chemicals also serves these areas of application with its highly efficient systems.

Applied Casting Solutions represent ASK Chemicals in Southern Africa. For further information contact Applied Casting Solutions on TEL: 011 922 1701 or visit www.chemsystems.co.za or www.ask-chemicals.com
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Morgan Thermal Ceramics has announced the availability of Cerox® fired refractory shapes, offered in a range of material compositions, including many specifically used for the manufacture of rotating and non-rotating airplane components and automotive turbochargers. Dense, hard, and chemically stable, Cerox fired refractory shapes offer resistance to chemical attack from acids, slags, and gases to produce the cleaner, contaminant-free metal desired by end users in aerospace and automotive steel foundries.

Fired shapes manufactured from Sillimanite Cerox 200 are composed of 74 percent alumina and fired mullite, which are prized for their chemical attack resistance, good thermal shock, and excellent non-wetting characteristics at temperatures as high as 1565°C. Other materials available include Cerox 700 which has a high alumina content as well as versatile shape capability, making it ideal for products with complex shapes, including crucibles, tundishes and launder systems. For complex shapes, Cerox 720, which also features high alumina content, is particularly adapted to developing shapes with thin walls, due to its fine grain and high strength.

Cerox shapes are fired to temperatures that create especially strong molecular bonds, making them superior in applications required to produce clean and contaminant-free Metals. Combined with precisely controlled firing and 100 percent product inspection, these high-quality components are ideal for the most demanding of high-temperature environments.

Morgan Thermal Ceramics offers engineering and design expertise to support customers in the development of crucibles, tundishes, and launder systems. They will provide expert advice on material composition, pre-heat schedules, custom shapes and part installation, throughout the design and development process.

For further details contact Morgan Advanced Materials South Africa on TEL: 011 815 6820 or visit www.morganthermalceramics.com

StrikoWestofen introduces mobile website and system-specific QR code identification

The StrikoWestofen Group offers faster system-specific support to their customers. This is made possible by the new mobile website of the company, providing the necessary contact options. A QR code retrofitted to all existing systems allows service technicians to give targeted counselling. The rapid evaluation of error messages sent via contact form makes a distinct contribution towards increased system availability.

Which spare part will improve the efficiency of my system? What does a certain error message mean? Why is there a drop in the efficiency of my system? There are a number of reasons why operators of melting and dosing systems require rapid and system-specific support from competent service partners. “At StrikoWestofen, service does not stop after the planning and delivery of the systems,” explains Holger Stephan, manager of the Service and Spare Parts department at StrikoWestofen. “Even our process-reliable melting and dosing systems are subject to wear. In case of need, a rapid system-specific reaction is important as every minute literally costs money. The new range of services we offer via our mobile website increases the system availability in particular.”

Service concept and rapid solutions

The innovative mobile service concept now allows direct system-specific contact to the relevant service partners at StrikoWestofen. For this purpose, StrikoWestofen will equip all melting and dosing systems with an individual QR code identification in future including all important system information, thus allowing system-specific support. Furthermore, StrikoWestofen will also offer the opportunity to transmit system parameters automatically and receive an evaluation of the error messages. This will limit system down times to a minimum. In addition, users can check for OEM spare parts for their particular system configuration by using the new mobile system. An online database provides the necessary descriptions of spare parts.

StrikoWestofen first presented its mobile service concept at the Euroguss 2014 in Nürnberg. The mobile website can be accessed via any portable terminal device with an internet function.

For further details contact Ceramic & Alloy Specialists on TEL: 011 894 3039 or visit www.ceramicalloy.co.za
An affordable price and low operational costs make the Bruker Elemental’s spark spectrometer Q2 ION elevates metal analysis into new levels of simplicity and ease-of-use. Today Q2 ION is one of the smallest and lightest ultra-compact spark emission spectrometer for metals analysis available. It is a versatile multi-matrix system for comprehensive incoming material inspection and quality assurance of metal alloys. Its affordable price and low operational costs make it the ideal tool for smaller and medium-size businesses.

Q2 ION covers all major alloying elements in many applications such as ferrous alloys, aluminium, copper, and many more. It ideally addresses the requirements of small and mid-size foundries, metal processing industries, fabricators, quality control departments, warehouses, metal recyclers, and even inspection companies.

It’s design makes Q2 ION ultra-light (less than 28 kg) so it can easily be hand-carried even to a nearby site for analysis. An optional case is also available. Despite its low weight, it is suitable for applications in which ruggedness is required. Q2 ION also defines new standards in ease-of-use. Place your sample onto the spark stand and press the start button. In less than thirty seconds you get the complete elemental composition of your metal.

The patented Flat Field CCD optics is a masterpiece of optics design and mechanical engineering. Active Ambient Compensation (AAC) provides maximum stability in a temperature range between 10 and 45°C. The high-definition CCD detector together with well-proven ClearSpectrum® technology provide best-in-class analytical performance.

For more information, contact your nearest IMP branch on, Gauteng TEL: 011 916 5000, KwaZulu Natal TEL: 031 764 2821, Western Cape TEL: 021 852 6133, Eastern Cape TEL: 041 364 2544 and Free State TEL: 018 293 3333 or email: info@imp.co.za or visit www.imp.co.za
Auto-deposition coating for ferrous castings

Henkel Corporation introduced a water-based reactive auto-deposition coating — Bonderite® M-PP 930C™ — formulated specifically to deliver a uniform, defect-free surface coating on raw cast components and ferrous metals. This innovative epoxy-acrylic urethane coating easily coats both the inside and outside of complex components, and delivers enhanced corrosion and abrasion resistance, excellent thermal stability, and superior edge protection, abrasion resistance and flexibility.

Depending on the type of substrate and cleanliness of the metal, application of Bonderite M-PP 930C can be as simple as a seven-step, room temperature deposition process that requires no electrical contacts and involves a chemical reaction between the water-based organic emulsion and the metallic surface.

The low-energy process uniformly coats large volumes of fully assembled, densely racked or complex-shaped metal parts and involves some combination of the following steps: cleaning, rinsing, coating, sealing and curing. From beginning to end, preparation and application usually takes significantly less time than competing processes.

Bonderite M-PP 930C will coat any surface it wets during immersion of the parts with no limitation as to part size, shape, complexity or density. The coating covers the entire inner diameter of cylindrical parts, controlling warranty exposure. The non-flammable, non-explosive, RoHS-compliant coating contains no toxic heavy metals, very low VOCs, and no APEs or HAPs. The developer calls the technology “an excellent coating for general industrial, heavy equipment, agricultural and construction equipment, trucks, trailers, and automotive applications.”

For further details contact Percy Jacobs of Henkel South Africa on TEL: 011 617 2400, www.henkel.com

Water-based reactive formulation for defect-free surfaces improves corrosion performance, surface and edge coverage.

The number one choice for measuring compressed air and technical gases in the bulk solids processing industry is the Endress+Hauser’s t-mass 150 thermal mass flow meter, specially designed for use in compressed air and supply networks.

Most of the energy used when producing compressed air is lost unnecessarily, whether through leaks, excessive system pressure or waste heat from the compressor.

Compressed air networks with leak rates of 30% and more are normal in many plants around the world. Quite startling, considering that energy conservation and reduction is top of nearly every company’s agenda. For this reason, more and more attention is being focused on compressed air and supply networks. A detailed insight into a system is needed to locate and minimise leaks in the network. By using several low-cost measuring systems in one line instead of one more accurate and more expensive main measurement, users can get a far clearer picture of their compressed air network. Endress+Hauser has the instruments to make this possible.

Reliable leakage-fixing

While small leaks in the overall gas flow go unnoticed when a primary-measurement system is used, measurements on a line reliably indicate an increase in the measured value. Experience shows that 3-6 line measurements are typically required for one primary measurement. Here, reproducibility is often more important than absolute accuracy in order to achieve long-term savings in the extensive distribution networks. In addition to minimum pressure loss, reliable operation is also a decisive factor for successful instrument deployment. This is because the measuring point, once commissioned, can often only be accessed with a great deal of effort.

The "small gas engine" for flexibility

The device is supplied as a completely preconfigured device in line with the client’s requirements. The t-mass comes with an integrated “gas engine”. At the device, users can directly select air, argon, nitrogen or CO₂ as the gas. By using the “gas engine” no recalibration on-site is required. All the gas parameters are calculated in the device based on the current operating state. Local operation displays plain text in all common languages.

The modular device design allows the instrument to be optimally adjusted to suit the application.

What is more, users can also benefit from the attractive procurement and low operating costs of t-mass 150. The robust housing construction withstands the heavy-duty ambient conditions in the bulk solids processing industry, while the solid sensor design is maintenance-free and has no moving parts.

Another advantage of the device is that it outputs the gas corrected volume directly. In this way it is possible to directly compare all the measuring points without the need for additional pressure and temperature compensation.

For further details contact Frans van den Berg of Endress+Hauser on TEL: 011 262 8000 or visit www.za.endress.com
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 settling, machining and/or X-ray testing, wasting both time and money.

The range of Novaset resins from Applied Casting Solutions 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 Applied Casting Solutions can enhance your bottom line and give you the competitive edge.

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